FINAL ENVIRONMENTAL IMPACT STATEMENT

I-75 from M-102 to M-59
Oakland County
Michigan

Prepared by

Michigan Department of Transportation

In Cooperation with

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

April 2005

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FHWA-MI-EIS-03-01-F
I-75 RECONSTRUCTION

Proposed Widening and Reconstruction
I-75 from M-102 to M-59
Oakland County, Michigan

FINAL ENVIRONMENTAL IMPACT STATEMENT

Submitted Pursuant to 42 U.S.C. 4332 (2)(c) and 49 U.S.C. 303

By The

U.S. Department of Transportation
Federal Highway Administration
and
Michigan Department of Transportation

May 31, 2005
Date of Approval

James J. Steele
FHWA Division Administrator

For additional information concerning the proposed project, or this document, contact:

Mr. Abdelmoez Abdalla
Environmental Program Manager
Federal Highway Administration
315 West Allegan Street, Rm. 207
Lansing, MI 48933
Phone: (517) 702-1820

Ms. Margaret Barondess
Environmental Section Manager
Michigan Dept. of Transportation
P.O. Box 30050
Lansing, MI 48909
Phone: (517) 335-2621

This Final Environmental Impact Statement describes the social, economic, and natural environmental impacts associated with proposed improvements to 18 miles of I-75 between M-102 (8 Mile Road) and M-59 in Oakland County. This document includes a summary of the planning basis and of the impacts associated with the proposed project and the process used in determining the Preferred Alternative. Mitigation measures are also included. The estimated cost of the proposed project is approximately $572 million (2005 dollars). Twenty-six residential, one church, and two business displacements are anticipated. The estimate of direct wetlands impacts is 0.4 acres.

Comments on this Final Environmental Impact Statement are due 30 days after the date of the publication of the Notice of Availability in the Federal Register and should be sent to Ms. Margaret Barondess at the Michigan Department of Transportation, P.O. Box 30050, 425 W. Ottawa Street, Lansing, Michigan 48909.

PREFACE

The National Environmental Policy Act (NEPA) of 1969 requires that the social, economic, and natural environmental impacts of any proposed action of the federal government be analyzed for decision-making and public information purposes. There are three classes of action. Class I Actions are those that may significantly affect the environment and require the preparation of an Environmental Impact Statement (EIS). Class II Actions (categorical exclusions) are those that do not individually or cumulatively have a significant effect on the environment and do not require the preparation of an EIS or an Environmental Assessment (EA). Class III Actions are those for which the significance of impacts is not clearly established. Class III Actions require the preparation of an EA to determine the significance of impacts and the appropriate environmental document to be prepared – either an EIS and a Record of Decision (ROD), or a Finding of No Significant Impact (FONSI).

This document is a Final Environmental Impact Statement (FEIS) for the proposed widening of I-75 from M-102 (8 Mile Road) to M-59 in Oakland County, Michigan. It presents the Preferred Alternative and the measures taken to minimize harm to the project area. The Draft EIS was approved December 24, 2003 and a public hearing was held January 27, 2004. This FEIS reflects the comments received during the public hearing process.

The FEIS will be distributed to federal, state and local agencies, private organizations, and all members of the public making substantive comments on the DEIS. Following the comment period on the FEIS, it will be forwarded to the Federal Highway Administration (FHWA) with a recommendation that a Record of Decision (ROD) be issued. The ROD will act as the Location/Design Approval document, allowing the project to move forward to the design stage, when funding is identified. After design is completed the right-of-way acquisition and construction phases will occur.

This document was prepared by a consultant working with the Michigan Department of Transportation (MDOT), in cooperation with FHWA. Representatives from the following areas within MDOT participated: Design, Project Planning, Real Estate, Construction and Technology, Traffic and Safety, and the Metro Region. Information was also furnished by other federal and state agencies, local units of government, public interest groups, an Advisory Council of stakeholders and interested local groups, and individual citizens.

This FEIS and the comments received on the DEIS may be reviewed at:

- MDOT's Lansing office, 425 West Ottawa Street (third floor), Lansing, MI 48933
- MDOT's Metro Region office - 18101 W. Nine Mile Road, Southfield, MI 48075
- MDOT's Oakland Transportation Service Center - 2300 Dixie Highway, Waterford, MI 48238
- Oakland County Community and Economic Development Department - County Service Center, 1200 North Telegraph Road, Building 34 East, Pontiac, MI 48341
- Auburn Hills Library - 3400 East Seyburn Drive, Auburn Hills, MI 48326
- Bloomfield Township Library – 1099 Lone Pine Road, Bloomfield Hills, MI 48302
- Detroit Library - 5201 Woodward Avenue, Detroit, MI 48202
- Ferndale Library – 300 East Nine Mile Road, Ferndale, MI 48220
- Hazel Park Library - 123 East Nine Mile Road, Hazel Park, MI 48030
- Madison Heights Library - 240 West 13 Mile Road, Madison Heights, MI 48071
- Royal Oak Library - 222 East Eleven Mile Road, Royal Oak, MI 48068-0494
- Troy Library - 510 West Big Beaver Rd., Troy, MI 48084

Technical documents that support the decision-making process are available upon request. Summaries of the FEIS are available at all locations.

Table of Contents

SECTION 3 – ALTERNATIVES

SECTION 4 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

l:\projects\3070\wp\reports\FEIS\FEIS-4.doc

LIST OF FIGURES

LIST OF TABLES

SECTION 1 - SUMMARY

1.1 Description of the Proposed Project

I-75, the main north-south roadway through Oakland County, is experiencing congestion in the peak periods that will get more severe and extend through greater portions of the day as the future unfolds. It provides three lanes in each direction through most of the county except for a section between Square Lake Road and a point west of M-24 that already has four lanes in each direction (Figure 1-1). A fourth lane also is present between M-102 (8 Mile Road) and I-696, but this lane is considered an auxiliary lane,[1] not a through travel lane, as it serves the weave movements to and from the many ramps in this section.

The *I-75 Corridor Study in Oakland County* (Feasibility Study),[2] completed in November 2000, recommended providing four through travel lanes in each direction throughout Oakland County. It also recommended the improvement of several interchanges and arterial streets near I-75. The federal action proposed by the Michigan Department of Transportation (MDOT) and covered by this Final Environmental Impact Statement (FEIS) addresses the reconstruction of I-75 and its widening from three to four through travel lanes in each direction between M-102 (8 Mile Road - exit 59) and a point south of M-59 (exit 77), a distance of 18 miles. The logical termini of the Preferred Alternative are M-102 and South Boulevard. South Boulevard is the southern limit of an independent project that would reconstruct the M-59 interchange.

The Preferred Alternative has independent utility, i.e., it can stand alone and provide transportation benefits without relying upon the development of other projects. The Preferred Alternative does not restrict consideration of alternatives for other foreseeable transportation improvements. It will connect the four-lane section of I-75 south of M-102 with that north of South Boulevard. The Preferred Alternative includes reconstructing the 12 Mile and 14 Mile Road interchanges. Modifications to the Crooks/Long Lake interchange and the I-75/M-59 interchange are separate projects and have received their own environmental clearance and, as such, are not covered in this FEIS. The environmental analysis of the Preferred Alternative covered in this FEIS extends from M-102 to South Boulevard.

This FEIS is a product of the I-75 Oakland County Planning/Environmental Study, which is listed in the Southeast Michigan Council of Government's (SEMCOG's) 2030 Regional Transportation Plan, in SEMCOG's Transportation Improvement Program (TIP), and in the Michigan Department of Transportation's (MDOT's) Five-Year Road & Bridge Program (Volume VI – 2004 to 2009) for the Metro Region.

This section summarizes the FEIS, addressing: 1) the project purpose and need; 2) alternatives considered and the Preferred Alternative; 3) the affected environment and impacts; 4) areas of controversy; 5) permits; and, 6) the project's status. Comments on the DEIS and responses are noted throughout, but are addressed specifically in Sections 6.3 and 6.4.

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[1] An auxiliary lane is one that begins as an on-ramp, but never fully merges with the mainline. Instead it continues as the rightmost lane of the freeway to the next exit, where it becomes an "exit only" lane. So it functions as a travel lane between two interchanges. The advantage is that it adds some mainline capacity and lengthens the decision-making distance and time for merges and diverges.

[2] *I-75 Corridor Study in Oakland County*; The Corradino Group for the Michigan Department of Transportation, the Southeast Michigan Council of Governments, the Road Commission for Oakland County and the Traffic Improvement Association; November 2000.

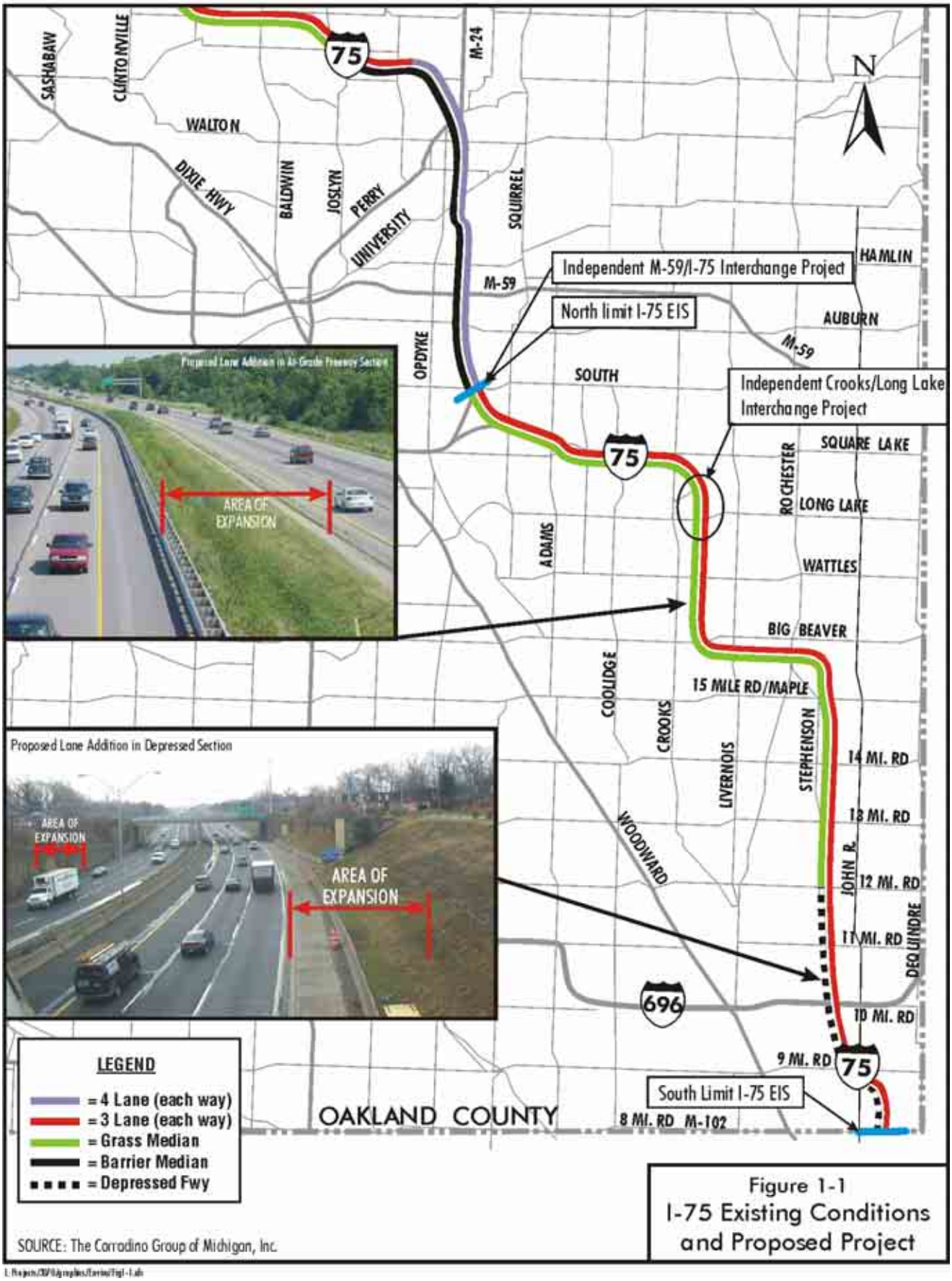

Figure 1-1
I-75 Existing Conditions and Proposed Project

1.2 Alternatives and Selection of the Preferred Alternative

This section summarizes the alternatives considered and the alternative recommended after the public hearing and consideration of comments. More detail is provided in Section 3.

No Build, Mass Transit, and several "build" alternatives were analyzed for this EIS, together with Transportation Systems Management (TSM) techniques, Transportation Demand Management (TDM) techniques, and Intelligent Transportation System (ITS) measures. TSM techniques are designed to maximize the efficiency of the arterial street system. TDM involves strategies for managing transportation demand - usually to reduce it or to shift it to different times, locations, routes, or modes. ITS measures involve the collection and dissemination of information to drivers in real time (overhead message boards on freeways), incident management (clearing crashes quickly), traffic signal systems that respond to demand, and similar measures.

Based on the results of the public hearing and comment period, a Preferred Alternative has been identified. It consists of a lane addition over the length of the project, ramp changes at the I-696 interchange, and reconstruction of the interchanges at 12 Mile Road and 14 Mile Road. The new lane would be dedicated to high-occupancy vehicle (HOV) use during morning and afternoon peak travel periods (approximately two hours in the morning and two hours in the evening – the remaining twenty hours, it would operate as a general purpose lane). The project will provide a new storm water sewer system in the southern section of the project where I-75 is below grade level, and modify the pedestrian overpasses in that section. The pedestrian modifications will conform to Americans with Disabilities Act (ADA) guidelines.

The Preferred Alternative is considered the Environmentally Preferred Alternative. Positive air quality effects are considered to outweigh the small loss of low-quality wetland acreage (0.4 acres) that will occur within the Square Lake interchange.

Major Oakland County employers[3] have endorsed the concept of the HOV lane, understanding that its potential capacity is greater than that of a general-purpose lane, and that the increased capacity supports employee and client access, goods movement, and the local economy.

Alternatives considered in the DEIS are described below, followed by a discussion of the Preferred Alternative.

1.2.1 No Build Alternative

The No Build Alternative consists of continued regular maintenance of I-75. Built in the 1960s, I-75 needs major reconstruction. The No Build Alternative would require no additional right-of-way. It would result in a breakdown of traffic flow through much of the day.

1.2.2 Transportation Systems Management (TSM) Techniques

Transportation Systems Management (TSM) techniques apply to the arterial street system, which, in large part, is under the control of local units of government and the Road Commission for Oakland County. Maximizing capacity on the arterial network cannot meet the project purpose

[3] Based on comments received on the DEIS from Automation Alley (which represents the automobile industry) and the Oakland County Business Roundtable.

and need. Only a lane addition on I-75 can meet that need. TSM techniques are and will continue to be included as area roadway improvements are made.

1.2.3 Transportation Demand Management (TDM) Techniques

Transportation Demand Management (TDM) means reducing demand or shifting it to different times, locations, routes, or modes. It focuses principally on administrative actions, such as working with major employers to support carpool and vanpool programs, or programs that encourage transit use. MDOT works actively with SEMCOG to promote alternative transportation modes. TDM techniques will continue, but will not alone meet the project purpose and need. The Preferred Alternative will support these activities, especially carpool and vanpool formation.

1.2.4 Intelligent Transportation Systems

Intelligent Transportation System (ITS) measures often involve the use of technology in transportation to save lives, time, and money. The measures have particular utility for freeways. Techniques include the collection and dissemination of information to drivers in real time (overhead message boards on freeways), incident management (clearing crashes and stopped vehicles quickly), coordinating traffic signals at ramp ends with the surrounding signal system, providing intelligent signal systems that adjust to traffic demand, and other similar measures. ITS maximizes use of the existing transportation infrastructure, but cannot substitute for physical expansion of roadway capacity, once efficiency is maximized. For this reason, while ITS will be an ongoing component of traffic management on I-75 and on the surrounding roadway network, it will not alone meet the project purpose and need. With HOV development, some ITS efforts will be devoted to providing information on the HOV lane availability, its hours of operation, ridesharing promotion, and other information.

1.2.5 Mass Transit

This EIS analyzed whether a rapid transit system can meet the purpose and need for the project. Rapid transit has potential in the Woodward Corridor (which parallels I-75) south of 9 Mile Road, but analysis shows rapid transit and an extensive supporting bus system have little effect on the traffic volumes on I-75 and do not eliminate the need for the proposed lane addition on I-75 between M-102 (8 Mile Road) and M-59.[4] Principal reasons are: 1) Oakland County residential development is dispersed; 2) many trips are internal to Oakland County and not easily diverted to transit; and, 3) demand in the I-75 corridor exceeds capacity, so any diversion to transit would be quickly replaced by others wishing to use I-75. A rapid transit system would offer an alternative means of travel and has merit, independent of the I-75 project. MDOT supports transit.

1.2.6 Build Alternatives

The "build alternatives" included adding a through travel lane between M-102 (8 Mile Road) and M-59 to bring the total lanes to four in each direction.[5] The lane could be used by all vehicles or be restricted to use by High-Occupancy Vehicles (HOV), with two or more persons, in peak

[4] *I-75 Corridor Planning/Environmental Study Refined Analysis of Transit and HOV Concepts (Technical Memorandum No. 2)* by The Corradino Group for the Michigan Department of Transportation, October 2002.

[5] During the 2000 Feasibility Study the concept of a reversible lane was considered. However, north-south travel demand is so balanced that a reversible lane was not reasonable.

hours. The Preferred Alternative includes reconstruction of the 12 Mile and 14 Mile Road interchanges, modification of the ramps from eastbound and westbound I-696 to northbound I-75, reconstruction of the existing pedestrian bridges over I-75, and separation of the storm water from I-75 from the combined sewer system in the south section of the corridor. The project also considered modifying curves on I-75 near 9 Mile Road and Big Beaver Road, and changing ramps at Square Lake Road. These design options were not practical (see Sections 3.7.1 and 3.7.3). The planned connections to the separate I-75/M-59 project are discussed. The build alternatives were referred to in the DEIS as the GP (General Purpose lane) and HOV (High-Occupancy Vehicle lane) alternatives.

I-75 Lane Addition for General Purpose Use – GP Alternative

Between M-102 (8 Mile Road) and Gardenia Avenue (the first cross street south of 12 Mile Road), I-75 is in a "cut" section, i.e., below grade level. The addition of a fourth through lane will occur by cutting into the existing side slopes. North of Gardenia Avenue, I-75 comes to grade or is elevated (refer to Figure 1-1). The lane addition will be constructed in the existing median from this point to Square Lake Road. From Square Lake Road to beyond M-59 there are already four through lanes and a lane addition is not required. The north limit of this I-75 lane addition project is north of South Boulevard, where the two lanes (eastbound-to-northbound) from Square Lake Road join the four northbound lanes of I-75 to form the six lanes planned with the I-75/M-59 project. This alternative will meet full, modern standards with the exception of the "S" curve south of 9 Mile Road.

Redesigning the north section of the "S" curve south of 9 Mile Road to meet current standards would push I-75 into the adjacent neighborhood to the west. More than 150 parcels, including approximately 100 homes and 20 businesses, would likely be affected. Therefore, these significant impacts make redesigning this curve not practical.

I-75 Lane Addition for HOV Use – HOV Alternative

The proposed fourth through lane will be dedicated to use only by high-occupancy vehicles in peak traffic hours. The proposal is to limit the use of this lane to vehicles carrying two or more persons (carpools, vanpools, and buses) during the morning and afternoon peak periods (preliminary analysis of traffic data suggest a morning period of 7 to 9 AM, and an afternoon period of 4 to 6 PM). So, for twenty hours of the day, the HOV lane will operate as a general purpose lane, like the other lanes. Analysis indicates that limiting the HOV lane to 3 or more persons restricted its use to the point that the lane is not viable.

HOV Lane

Three HOV options, varying in their length of application and the degree to which direct access is provided, were considered.[6] Analysis concluded that special facilities such as exclusive HOV ramps generated little additional use of the HOV lane, but led to substantial relocations, impacts and costs. As these impacts could not be justified, only the basic HOV concept was advanced for consideration in the DEIS. The basic HOV concept requires only signs and striping of the new lane, without special access. For the HOV lane to be effective, enforcement must be strict.[7]

1.2.7 Additional Design Considerations

Several design options considered for inclusion in the build alternatives are discussed below.

Ten-Foot Median Shoulders

Ten-foot inside shoulders meet modern design standards. However, 12-foot inside (median) shoulders are preferred to 10-foot shoulders when more than 250 trucks are present in the peak travel hour, as is the case on I-75. I-75 is now designed with 10-foot shoulders. To add the two feet would require the total reconstruction of the twelve bridges from 12 Mile Road north to the north project limit (rather than widening), resulting in an inconsistent cross section along I-75 in Wayne and Oakland counties. It would also affect three churches and four residential parcels, with a potential cost up to $100 million. Twelve-foot inside shoulders were not considered practical, due to the significant social, environmental and economic impacts.

Curve at Big Beaver Road

I-75 at Big Beaver Road was originally constructed as a rural highway section, as the area was rural at that time. Adding the lanes in the median area, as called for in the Preferred Alternative, and simultaneously maintaining the existing rural standards, would necessitate at least partial reconstruction of the interchange. Such reconstruction would affect a motel and buildings of the City of Troy government complex on the inside of the curve, or the curves of the ramps within the interchange would have to be tightened. Urban standards allow a tighter curvature to the mainline interstate and would avoid these impacts. As the area is now urbanized, urban standards are appropriate, and use of rural standards in reconstructing and adding lanes to this section of I-75 was not considered practical.

Eliminating the Left Exit/Entrance on Northbound I-75 at Square Lake Road

For safety reasons, left exits and entrances are not desirable. To convert the left exit and entrance to a right exit and entrance on northbound I-75 at Square Lake Road would require the construction of flyovers, one for a right exit, another for a right entrance. Both would require new right-of-way and result in substantial relocations. An examination of travel patterns (movements from Square Lake Road to M-59, I-75 to M-59, and the reverse movements) supported the existing design. Therefore, the recommendation was to leave the left exit and left entrance as they are. Changing the exit and entrance was not considered practical.

[6] Ibid.
[7] *I-75 Corridor Planning/Environmental Study Refined Analysis of Transit and HOV Concepts (Technical Memorandum No. 2)* by The Corradino Group for MDOT, October 2002.

Auxiliary Lanes, I-75 from M-59 to Square Lake Road

The M-59 interchange with I-75 is a separate project. The five southbound lanes of that project will match the five southbound lanes of the Preferred Alternative near South Boulevard. Similarly, northbound, two lanes from Square Lake Road will join the three existing, plus one proposed, lanes of I-75 to form the six-lane section that will match to the I-75/M-59 project north of South Boulevard. Therefore, the build alternatives would not require any additional changes north of South Boulevard beyond those planned for the separate I-75/M-59 interchange project.

I-696 Interchange

Traffic exiting eastbound I-696 to northbound I-75 backs up frequently. The primary cause of backups at this location is an inability to merge into the northbound traffic flow on I-75. The recommendation is to have the northbound off-ramp to 11 Mile Road pass under the northbound on-ramps from I-696 to prevent merge/diverge conflicts. This is called "braiding" the ramps (see figure on next page). The design in the DEIS did not allow direct exiting from the I-696 ramps to 11 Mile Road. The cities of Royal Oak and Madison Heights objected to this change in access. Additional engineering analysis determined that the connection could be maintained, but the result would be an additional 14 residential relocations.

12 Mile Road and 14 Mile Road Interchanges

Two options at the 12 Mile Road interchange were considered in the DEIS. One was to reconstruct it to retain some of its existing geometrics. The second was to rebuild it as a Single-Point Urban Interchange (SPUI). A SPUI brings all ramp ends together at a single point and provides for a three-phase signal operation at the resulting intersection. The three phases control: 1) left turns from the ramp ends; 2) left turns to the entrance ramps; and, 3) the through movement of 12 Mile Road. With appropriate design, this control aids pedestrian movements. Optionally, the interchange could retain some of its current configuration (see figure on next page). As the southbound exit ramp to 12 Mile Road is now positioned too close to Stephenson Highway, the loop ramp serving westbound to southbound traffic would be eliminated. This would allow the southbound off-ramp to shift east, away from Stephenson Highway. The westbound to southbound movement would be accommodated instead by a left turn from 12 Mile Road to the southbound entrance ramp in the southwest quadrant of the interchange. MDOT has determined to reconstruct the interchange. However, during the design and value engineering phases of this project, the interchange design would be reexamined.

The I-75 Feasibility Study (2000) anticipated the 14 Mile Road interchange would benefit from a SPUI design. However, more detailed analysis for the DEIS found that a modification of the existing interchange would serve traffic better. So through capacity is proposed to be added on 14 Mile Road, and left-turn capacity from 14 Mile Road to I-75 would be increased. These changes will necessitate the reconstruction of the I-75 bridges over 14 Mile Road. Other improvements to 14 Mile Road are being addressed independently with the stakeholders on 14 Mile Road, as it is under the jurisdiction of the Road Commission for Oakland County.

1.2.8 Practical Alternatives

Analysis finds that mass transit is viable in the Woodward Corridor (and MDOT supports this finding), but clearly shows that even under the best-case scenario a Mass Transit Alternative cannot eliminate the need for four travel lanes in each direction through the project length. Nevertheless, the transit concept has been included in the background system, along with the

roadways in the cost-feasible *Regional Transportation Plan*. TSM, TDM, and ITS are also incorporated into all alternatives. The practical alternatives carried forward through the DEIS were:

Ramp Braiding North of I-696

12 Mile Road Interchange Modification

- No Build – Continued regular maintenance with no capacity improvements.
- GP Alternative – Addition of a general-purpose travel lane between M-102 and north of Square Lake Road, to bring the number of through travel lanes to four in each direction.
- HOV Alternative – Addition of an HOV lane in the same manner as the GP lane, but signed and striped for HOV use during peak hours (for example, 7-9 AM and 4-6 PM). The northbound HOV lane is carried through the Square Lake Road interchange.

The GP and HOV alternatives were to be accompanied by reconstruction of the 12 Mile and 14 Mile Road interchanges with improvements, the ramp braiding north of I-696, reconstruction of the pedestrian bridges over the depressed section of the freeway, construction of a new storm water system in the south part of the corridor, and new storm water retention in the north section of the corridor. Both alternatives would tie to auxiliary lanes that are planned with the separate I-75/M-59 project. The I-75/M-59 and Crooks/Long Lake interchanges, while not part of this project and EIS, are considered part of the background system. The designs of all three projects will be integrated, although each has independent utility.

The above practical alternatives were presented at the public hearing.

1.2.9 Preferred Alternative

Based on the analysis performed for the DEIS and the results of the public hearing and comment process, a Preferred Alternative has been identified. It is to construct one new lane in each direction between M-102 (8 Mile Road) and South Boulevard, the south limit of the independent M-59/I-75 Interchange project. The new lane will be constructed by cutting into the outside earthen bank in the depressed section and into the grassy median in the at-grade/elevated section. The lanes will be limited to use by High Occupancy Vehicles (HOVs) during peak hours (for example, between 7 and 9 AM and 4 and 6 PM). HOVs are defined as vehicles with 2 or more occupants, including buses. Access from I-696 to northbound I-75 will be modified to improve traffic flow and safety. The Preferred Alternative also includes the reconstruction of the 12 and 14 Mile Road interchanges. Pedestrian bridges in the south section of the corridor will be rebuilt and will conform to Americans with Disabilities Act (ADA) guidelines. Context sensitive design will be coordinated with the local municipalities during the design phase of the project. Storm sewers will be constructed in the depressed section of the corridor to separate I-75 storm water from the combined (storm water and sewage) system that serves the area today. Storm water retention will be provided throughout the corridor so that storm water flows do not exceed present levels.

The determination to dedicate the lane addition to HOV is based on the success of similar designations elsewhere that have increased corridor capacity. More persons can be moved per lane with HOV. There are few alternatives to I-75 for mid- to long-range trips. Transit analysis has found that, even with a rapid transit system on Woodward Avenue (the corridor designated through other planning studies as the priority corridor for high-type transit), little relief is provided to I-75. HOV is the best way to get the maximum use out of I-75. HOV lanes support bus transit development, vanpooling, and conventional carpooling. The potential exists to substantially increase people movement in these higher density modes.

The Road Commission for Oakland County asked that the potential for High Occupancy Toll (HOT) lanes be studied. The concept is to offer the option to the public of using the HOV lane for a fee. Any underutilized capacity in the HOV lane can be filled up by allowing single-occupant vehicles into the lane for a fee. The fee can be adjusted to control the number of additional users, so that a high level of service continues to be provided.

HOT lanes now in operation in the U.S. are physically separated from general traffic lanes so that HOT lane use can be monitored and fees charged. This physical separation is not possible on I-75 in the study area. *Technical Memorandum No. 3, Median Shoulder Evaluation*, found that adding only two feet to the pavement need in each direction resulted in significant impacts.[8]

Additionally, HOT lanes are generally implemented after HOV lanes are established and their flow characteristics are fully known. HOT lanes also require a substantial capital investment and an oversight agency with tolling authority. After implementation of the HOV lanes, and if conditions warrant it, HOT lanes may be studied in the future.

The ramp braid design has been modified from that presented in the DEIS due to concerns of Royal Oak and Madison Heights about lack of access from I-696 to 11 Mile Road. The modified

[8] *I-75 Oakland County Planning / Environmental Study Technical Memorandum No. 3, Median Shoulder Evaluation*, by The Corradino Group for MDOT, September 2003.

design results in 14 more residential relocations, but was preferred by the two communities as it maintains existing traffic patterns, especially access to businesses along 11 Mile Road.

The 12 Mile Road interchange reconstruction will modify the ramp configuration in the northwest quadrant. The westbound-to-southbound loop ramp would be eliminated. A left turn from westbound 12 Mile Road to the existing southbound on ramp in the southwest quadrant of the interchange will serve this movement. Today, westbound traffic on 12 Mile Road backs up from Stephenson Highway and blocks traffic exiting southbound from I-75. Eliminating the loop ramp will allow the southbound off ramp to be shifted east, away from Stephenson Highway and its queuing traffic. This option is approximately $6 million less costly than the construction of a SPUI. The Road Commission for Oakland County in their comments on the DEIS supported development of SPUI interchanges. In the case of 12 Mile Road, during the design and value engineering processes, the interchange design will be reevaluated.

Analysis for 14 Mile Road found that reconstruction of the existing interchange is the most desirable course. A SPUI was examined, but not found to be practical, as it could not provide an adequate level of service in the design year.

The Preferred Alternative will require reconstruction of the six pedestrian bridges that now cross the below-grade section of I-75. The reconstruction will conform to guidelines issued pursuant to the Americans with Disabilities Act (see Section 3.7 and Figure 3-3) and will consider context sensitive design, where appropriate.

The proposed I-75 lane addition will increase surface water runoff. Because management of storm water is an important issue in the corridor, MDOT performed an analysis of storm water that will be generated by the project. The study and further efforts during the design phase will ensure that storm water from the project does not cause harm either up- or downstream from the project (see Sections 1.3.9 and 4.10).

1.3 Impacts

The following is a summary of the impacts associated with the No Build Alternative and Preferred Alternative (Table 1-1). A more detailed description of impacts is found in Section 4. Proposed mitigation measures are found in Section 5.

1.3.1 Traffic and Safety

The Preferred Alternative was found to improve traffic flow over the No Build Alternative.[9] The mainline lanes over most of the corridor will operate at a Level of Service (LOS) D or better in the design year (2025), compared to breakdown conditions (LOS F) with the No Build Alternative. A *Crash Analysis* identified patterns and concentrations of crashes and developed a set of countermeasures to improve safety with project construction.[10] Countermeasures are summarized in Section 2.2.6. They include such measures as glare screens, warnings signs and flashers, and lengthened acceleration and deceleration lanes.

[9] *Traffic Analysis Report*, The Corradino Group, November 2003.
[10] *Crash Analysis*, The Corradino Group, June 2003.

Table 1-1

Summary of Impacts – Preferred Alternative

Impact Category	Expected Impact
Traffic and Safety	Mainline I-75 Level of Service D or better (except 11 Mile Road to 14 Mile Road), compared to LOS F with No Build. Safety will improve.
Relocations	Twenty-six single-family residences, one church, and two businesses.
Community Cohesion	Improved access across I-75 for pedestrians and bicyclists.
Environmental Justice	No disproportionately high and adverse human health or environmental effects on minority or low-income populations.
Land Use	Consistent with local and regional planning documents.
Farmland/Act 451, Part 361	No prime or unique farmlands. No Act 451, Part 361 lands.
Economics	Added capacity responds to growth and supports the focal point of Michigan's economic growth. Tax base losses insignificant.
Air Quality	Lower emissions from improved traffic flow. No violations of the National Ambient Air Quality Standard for carbon monoxide. Project is included on air quality conforming *2030 Regional Transportation Plan*.
Noise	430 dwelling units, 1 school, and 5 churches would be exposed to noise levels exceeding the 66 dBA criterion under future no build conditions compared to 466 dwelling units, 1 school, and 5 churches with the project. Mitigation would substantially reduce impacts under build conditions.
Surface Water	Two crossings of River Rouge and 10 of county drains. Storm water quantity will increase, flow rate will not. Storm water in depressed section will be separated from current combined sewer system, a positive effect.
Wetlands	Preferred Alternative affects 0.41 acres of Palustrine Emergent, and Palustrine Shrub-Scrub. Potential 0.61 acres of mitigation at an approved site.
Threat/Endangered Species	None.
Cultural Resources	No potential *National Register* eligible sites or districts affected.
Parks/Recreation	No effect on any park. No Section 4(f) or 6(f) involvement.
Visual Conditions	Reduction of grassy banks and landscape plantings from 8 Mile to 12 Mile (depressed section) and grass median north to Square Lake Road (at-grade and elevated section).
Contaminated Sites	One site is recommended for Phase II testing.
Soils	Cutting into banks of depressed section could undermine some existing noise walls, requiring stabilization or reconstruction. Poor soils in north project area, potentially affecting noise wall cost, but no anticipated problems with roadway construction.
Utility Systems	Utility relocation on I-75 bridges. No effect on high-tension electric line at 12 Mile Road or any cell towers. Relocation of MDOT traffic surveillance equipment necessary.
Indirect and Cumulative	Project responds to growth, consistent with local planning. Together with other regional projects, there will be future impacts to resources from development, subject to local, state, and federal laws and regulations.
Energy	Energy used during construction. Fuel savings upon opening.
Project Costs (2005 dollars)	• Right-of-way $16,000,000 • Design $93,000,000 • Construction $463,000,000 Total $572,000,000

Source: The Corradino Group of Michigan, Inc.

1.3.2 Relocations and Community Cohesion

Right-of-way acquisition and access changes can affect the cohesion of a neighborhood. Physical features of the I-75 project that will require new or additional right-of-way are:

- The lane addition;
- "Braiding" of ramps north of I-696;
- Reconstruction of pedestrian bridges; and
- Storm water detention.

The proposed lane addition itself will not require relocation of dwelling units, but two businesses in Hazel Park would be relocated. Parking from several businesses and a church would also be necessary. Right-of-way acquisition for the lane addition for 18 miles will be approximately one acre.

Right–of-way acquisition will be required for the "braiding" of ramps north of I-696. This safety and operational improvement could involve relocation of occupants of 23 single-family dwellings and one church in Madison Heights and a total of approximately 7 acres of land.

Right-of-way may be acquired with reconstruction of six pedestrian bridges. Reconstruction must conform to the Americans with Disabilities Act (ADA), which presently requires gradually sloping ramps and therefore, more land. Steps, in addition to the ramps, will be provided where feasible, to allow more direct movements for persons without disabilities. The right-of-way acquisition could affect three dwelling units and approximately one acre of land in Hazel Park. These impacts will be refined during the design phase when more detailed information is available. For example, draft ADA guidelines offer the option of providing elevators rather than ramps. Limited-use, limited-access (LULA) elevators are available only to those who qualify and operate only with a pass card. These elevators are not accessible to the general public. Such elevators may eliminate the need for right-of-way acquisition and the attendant relocations that are anticipated with ramp development, and so may be considered when the Preferred Alternative is implemented. Only one comment was received with respect to pedestrian bridges. Madison Heights suggested that the need for the Bellaire pedestrian bridge be evaluated. MDOT has determined that this pedestrian overpass should be reconstructed to serve the adjacent neighborhoods and the St. Denis Elementary School.

Storm water detention requirements in the north section of the project may require as much as seven acres of right-of-way. This acquisition in Troy would relocate no homes or businesses, as a site was identified that is currently undeveloped. Detention will be designed to avoid relocations.

In summary, the braid would impact twenty-three homes and a church, a pedestrian bridge at Harry Avenue would impact three more homes (unless elevators were used), and the lane addition would impact two businesses. So a total of 26 homes, a church, and two businesses would be impacted by the Preferred Alternative. These are preliminary estimates and are subject to change during the design phase.

Community cohesion will not change appreciably as the basic footprint of I-75 will not change. Access across the freeway will be improved where bridges are replaced with the project. Sidewalks or shoulders will be provided on bridges.

1.3.3 Land Use

Rapid growth in mid- and north Oakland County puts continued pressure on I-75. Meanwhile, no significant capacity improvement in the project length has occurred since construction in the 1960s. While communities in the northern and western parts of Oakland County have grown, a number of communities in the southern part of the corridor have shown population declines. SEMCOG attributes land use changes during the period 1990-2000 to:[11]

- Local planning and zoning;
- Land availability;
- Transportation;
- Sewer and water services; and,
- Social and policy dynamics, including:
  - ✓ Residential segregation by race and income;
  - ✓ Federal tax subsidies for home mortgage interest and property taxes;
  - ✓ School funding and quality;
  - ✓ Crime and public safety;
  - ✓ Societal ideals of lifestyle and urban design;
  - ✓ Constitutional protection of property rights;
  - ✓ Infrastructure financing policies; and,
  - ✓ The extent of personal vehicle ownership and use.

The cumulative impact analysis found that some farmland conversion occurs because the land is uneconomic for farming purposes. Further, the farming community is aging, and it is likely that some farmers are selling their farms as they move toward retirement.[12]

SEMCOG concludes that undeveloped land will continue to develop as population shifts north and west in Oakland County, as well as to areas in western Wayne County, central Macomb County, Ann Arbor, and southeast Livingston County. Job growth will not be as dispersed as population growth. New jobs will be concentrated in fewer suburban communities, reflecting the stronger role of transportation access and the trend to centralize jobs. The City of Detroit will experience continued job loss until 2020, when the situation will become more stable.[13]

The Preferred Alternative is consistent with local and regional transportation and land use planning, including Oakland County's *Composite Master Plan Map* and SEMCOG's *Regional Transportation Plan.*

Transportation Riders United (TRU) and several individuals commented on the DEIS that the proposed project will cause sprawl and cause people and jobs to move to northern Oakland County. Sprawl is addressed in Section 4.18 of this FEIS and in the *Indirect and Cumulative Impact Analysis Technical Report* (January 2005), especially the section at the end of that report entitled "Regional Issues". As noted above in SEMCOG's work, transportation is but one component of land use change. SEMCOG has noted a number of factors: residential segregation by race and income, federal tax subsidies for home mortgage interest and property taxes, school funding and quality, crime and public safety, societal ideals of lifestyle and urban design,

[11] *Land Use Change in Southeast Michigan: Causes and Consequences*, SEMCOG, March 2003.
[12] *Draft Environmental Impact Statement, M-15 from I-75 to I-69 – Oakland and Genesee Counties*, The Corradino Group, December 2001.
[13] *2030 Regional Development Forecasts,* SEMCOG.

constitutional protections of private property rights, infrastructure financing policies, and greater personal vehicle ownership and use.

1.3.4 Environmental Justice

The Preferred Alternative will not cause disproportionately high and adverse impacts to minority populations and low-income populations located in and near the project area. Impacts such as relocations, increase in noise levels and construction impacts will affect all populations who live near or travel I-75 each day. MDOT will develop mitigation measures to minimize these impacts. However, a continuing effort will be made to identify any additional impacts that may have a disproportionately high and adverse affect on minority and low-income populations during subsequent phases of this project. If any new impacts are identified, every effort will be made to actively involve these populations in the project development process, and to avoid or mitigate these impacts.

1.3.5 Economics

Economic activity in the project area is generated by a variety of market sectors including retail trade, services, distribution, industry, education, and public administration. The corridor has been subject to rapid development at its north end. South of M-59 this trend is expected to slow.[14] Further north, where developable land is available, and where local planning and zoning permits (and sometimes encourages), this growth is expected to continue.[15]

Between M-102 and M-59, I-75 provides access to substantial residential concentrations, linking these to jobs both south (Detroit) and north (especially near I-75 interchanges such as Big Beaver Road, Crooks Road, and University Drive). Commercial activities, such as the Oakland Mall and the Great Lakes Crossing Mall (and associated retail areas) are heavy generators of traffic. Adding capacity to I-75 is a response to the growth that has already occurred and the growth predicted by the local political jurisdictions in the corridor.

Property acquisition will result in a reduction in real property tax revenues of about $179,000, based on the right-of-way cost estimate. This represents only very minor percentages of the property taxes collected by Hazel Park, Royal Oak, Madison Heights, and Troy. The largest effect in terms of the percent of tax base would be on Hazel Park, at two hundredths of one percent. Any loss is important to that community, but the increase in State Equalized Value (SEV) of properties over the coming years will outweigh potential losses. (For example, the increase in SEV for corridor communities between 1990 and 2000 was 257% - see Table 4-8.) Because there are few anticipated business or residential relocations, replacement commercial space and housing is available and is not an issue.

1.3.6 Air Quality

Air quality along I-75 will improve with the project, as there will be less idling and smoother traffic flow. A test of carbon monoxide (CO) concentrations along I-75 and at the busiest intersections near I-75, at locations where humans might be present for periods of an hour or more, found one-hour and eight-hour ambient air quality standards for CO would not be violated

[14] Ibid.
[15] *Land Use Change in Southeast Michigan*: Causes and Consequences, SEMCOG, March 2003.

under either build or no build conditions.[16] The HOV lane of the Preferred Alternative will support transit and ridesharing, which will reduce the number of vehicles on the road.

The project is included in SEMCOG's air quality conforming *2030 Regional Transportation Plan (RTP)*, with construction planned in the 2011 to 2015 timeframe.

1.3.7 Noise

For most of the corridor the noise levels with the project will increase in an imperceptible way. In a situation where noise is already continuous, a doubling of traffic in the loudest hour must occur before most people can discern an increase in noise. This equates to a 3-decibel increase. Based on the proposed improvement in roadway capacity and traffic flow, the noise increase will be just over one decibel in most locations. Nevertheless, because many homes are already exposed to noise levels above abatement criteria, abatement is warranted in several locations.

The analysis found that 430 dwelling units, one school, and five churches would be exposed to noise levels exceeding the 66 dBA criterion (the threshold for determining residential impacts) under future no build conditions compared to 466 dwelling units, one school, and five churches with the proposed project. With the build alternatives, noise mitigation, likely walls, will be included as a normal part of the project's federal funding (subject to local review and approval of property owners). This mitigation will reduce the number of dwelling units exposed to undesirable noise levels by about 400 dwelling units, a substantial positive effect.

With the No Build Alternative, mitigation would only be considered "Type II" or retrofit. While MDOT does undertake Type II projects, funding is very limited. Under MDOT's *Noise Policy*[17] only the southern section of the corridor would be eligible for walls, as the communities to the north allowed residential development to occur in areas too close to the freeway, which exempts them from federal funding.

A *Noise Study*[18] using the FHWA's TNM2.1 computer model found that approximately 4.9 miles of noise walls are warranted (see Figure 4-5). These would provide at least a six-decibel noise reduction in the loudest hour, and "benefit" (defined as a 5-decibel reduction) about 400 dwelling units. Context sensitive design solutions will be explored with the local communities during the design phase of the project.

1.3.8 Ecological Resources

Forty-one wetland areas were identified between 12 Mile Road and South Boulevard.[19] South of 12 Mile Road, I-75 is depressed and there are no wetlands. North of South Boulevard, changes to I-75 are a part of the separate I-75/M-59 project. Most wetlands in the corridor are associated with roadside ditches. As the proposal is to widen I-75 using the median, effects on wetlands are limited to the proposed HOV lane through the Square Lake Road interchange.

Approximately 0.41 acres of wetlands would be directly affected by the Preferred Alternative as the HOV lane traverses the Square Lake Road interchange. Affected wetlands will require

[16] *Air Quality Impact Analysis, Technical Report*, The Corradino Group, October 2003.
[17] *Noise Abatement*, Michigan State Transportation Commission Policy, July 31, 2003.
[18] *Noise Study Report*, The Corradino Group, December 2004.
[19] *Wetland Report*, Tilton & Associates, Inc., October 2003.

replacement through agreement with the Michigan Department of Environmental Quality (MDEQ).

No known federal threatened, endangered, or special concern or state-listed species will be affected. The project traverses a developed, largely urbanized corridor.

1.3.9 Storm Water

Storm water will increase with the project due to the increased impervious surface of the additional lanes. A *Drainage Study*[20] was performed to determine how best to handle the increase in storm water runoff.

In the south section of the corridor (the depressed section) storm water now flows into the combined (sewage and storm water) sewer system in that section of the corridor. The Preferred Alternative will separate I-75 storm water from this system. The combined system flow now goes by way of the Twelve Towns Drain to the Twelve Towns Retention Treatment Facility (RTF). Under low flow conditions, the combined sewage enters the Dequindre Interceptor, which eventually flows to the Detroit Wastewater Treatment Plant, where the combined sewage is treated. Under high flow (storm) conditions, the combined sewage overflows into the Red Run Drain. By providing its own system for I-75 storm water, MDOT will positively affect water quality by: 1) reducing flow in the combined sewer system so that overflows of sewage into the Red Run Drain occur less frequently; and, 2) reducing flow to the Detroit Wastewater Treatment Plant, so that facility treats less storm water.

In the north section, where I-75 has a rural design, the Preferred Alternative will reduce the retention area now provided by the median and increase impervious surface. Both actions will increase storm water flow. Therefore, detention has been included at a site north of Maple Road on the east side of I-75 to maintain existing flow rates. This will prevent peak flows during storm events (50-year storms) from exceeding existing rates.

1.3.10 Cultural Resources and Parkland

A *Cultural Resources Survey* found no evidence of adverse effects to archaeological (below ground) resources.[21] It also found that of the 165 buildings and structures surveyed within the approved Area of Potential Effect (APE), none are potentially eligible for the *National Register of Historic Places.* Resources that are eligible for the *Register* are afforded special protection under federal law. The State Historic Preservation Officer concurred in these findings in letters dated October 1, 2002 and May 14, 2003.

Maddock Park in Royal Oak is adjacent to the southbound I-75 service drive (see Figure 4-1a). It is separated from I-75 by a noise wall. A grading permit may be necessary near the park, but there will be no effects on the park. The Troy Family Aquatic Center and Huber Park in Troy are adjacent to northbound I-75, but are separated from the road by a berm (see Figure 4-1c). This recreation area will not be affected.

[20] *Drainage Study*, Orchard, Hiltz & McCliment and Rowe, Inc., October 2003.
[21] *Phase I Cultural Resources Survey of the Proposed I-75 Freeway Improvements, Oakland County, Michigan,* Commonwealth Cultural Resources Group, Inc., December 2002.

1.3.11 Visual Conditions

Visual effects relate to the view of the road and from the road for each of I-75's two distinct sections. The southern, depressed section, between M-102 and 12 Mile Road, is now flanked by grassy banks and occasional ornamental trees (Figure 1-1). Drivers see only the road, bridges over I-75, embankments on either side, adjacent buildings or noise walls. With the project some remnants of grassy banks may remain in wider areas of the depressed section, but overall there will be a more monolithic concrete visual environment, including a concrete median safety barrier. Portions of the depressed section between I-696 and Gardenia are bordered by brick noise walls at the top of the grassy banks. The noise walls will remain (though some may be relocated). Additional noise walls will be built, subject to final analysis and community acceptance. The view of the road in the depressed section is limited, as the road is below grade level. This will change where noise walls are added. The walls will be evident from the surrounding area with the project.

The ramp braiding prompted concern by Madison Heights of visual intrusion, however, the ramp modifications will occur at or below grade level.

The northern at-grade/elevated section has a grassy median. Construction of the Preferred Alternative will remove this vegetation.

North of 12 Mile Road, I-75 is generally above the surrounding landscape at cross roads, so the adjacent land uses are visible. These views will not change as a result of the project. Since construction during the 1960s, vegetation has grown up along the fence lines. The mature vegetation along fence lines should not be disturbed with the project except in areas where noise walls are built. The view from the road would change only in these areas where noise walls are built. Likewise the view of the road will not change as the widening is within the median. Some clearance of vegetation is recommended for safety purposes (sight distance) within interchanges at Big Beaver Road and Rochester Road.

Design elements of the Preferred Alternative would be refined in conjunction with the Crooks/Long Lake I-75 Interchange Project and the I-75/M-59 Interchange Project for continuity.

1.3.12 Hazardous Materials

No substantial problems with contaminated materials are anticipated. One site, just south of 4th Boulevard in Royal Oak, where right-of-way acquisition is expected, was identified as a possible former gas station with underground storage tanks. This site was rated medium/high for contamination potential and additional investigation of the site (Phase II) is recommended.

1.3.13 Soils and Utilities

Mucky and peat soils are present in some locations in the north portion of the corridor. This could affect the cost of noise wall construction, but is not expected to affect roadway construction. Geotechnical studies have been performed to support project cost estimates.

The towers for a 120kV electrical transmission line in the north section of the 12 Mile Road interchange would not be affected. A cell tower at Square Lake Road and Adams Road that is close to I-75 would not be affected. Other cell towers are similarly unaffected. There will,

however, be an effect on MDOT traffic monitoring equipment, some of which is located in the median.

Effects on utilities will be consistent with normal utility relocation for roadway projects, particularly in the depressed section, as utilities are carried across I-75 on the crossroad bridges.

1.3.14 Indirect and Cumulative Impacts

Indirect impacts have been examined by determining which roads might be affected by a capacity increase (lane addition) on I-75.[22] Roads that would experience an increase in congestion and would be over capacity were identified. The assumption is that if congestion increases, the next step would be to widen a road to relieve the congestion and thus create impacts. Where this was the case, the impacts of roadway widening were estimated. These indirect impacts are summarized in Section 4-18. Diverting storm water from the combined sewer system in the southern portion of the corridor will have a long-term beneficial effect on water quality by reducing overflows of sewage-containing water into surface waters.

Cumulative effects occur when other planned improvements are examined in conjunction with the lane addition to I-75. Regardless of changes to I-75, growth will continue to occur as individuals and commercial entities develop their properties, consistent with local zoning. The population in the project area has grown dramatically for years with no improvement to I-75. In response, many roadway projects are planned. Analysis found that when these projects are combined with the lane addition on I-75, additional links not identified in the indirect impact modeling show congestion increases. Effects of widening these additional links have been estimated and are considered cumulative impacts.

A review of trends in the economy including: the auto industry; population shifts away from the core of Detroit, especially during the 1970s; the decline in farming and conversion of land to residential and commercial uses; implementation of wetland protection laws; and other factors, finds that development along I-75 reflects a complex mixture of actions, such that widening I-75 will not have significant cumulative effects. Cumulative effects are discussed in Section 4.18.

1.3.15 Energy

Fuel savings to motorists should be realized in the long term due to improved traffic flow and more constant traveling speeds.

1.3.16 Cost

The base cost of the Preferred Alternative will be about $572 million (2005 dollars). This includes right-of-way and relocation costs of $16 million. The cost associated with the signing and striping for the HOV, plus the cost of building bridges to carry an HOV lane north through the Square Lake Road interchange, would be approximately $5 million. Note that the costs of separating I-75 storm water from the combined sewer system in the south section of the corridor are built into the overall construction costs, amounting to $11 million.

[22] *Indirect and Cumulative Impact Analysis Technical Report*, The Corradino Group, January 2005.

1.4 Areas of Controversy

A principle concern expressed by citizens attending public meetings is that noise walls be constructed with the project. Construction of 4.9 miles of noise walls is proposed, in accordance with FHWA Noise Abatement Criteria and warrants contained in MDOT's Noise Policy.[23]

Several studies in the past have called for rapid transit development in the Detroit-Ann Arbor corridor and Woodward corridor.[24] Extensive analysis of mass transit performed for this EIS supports the view that transit is viable along the Woodward Corridor, but that it cannot substantially change the need for the I-75 project. A concern expressed by some transit supporters is that spending highway dollars diminishes the potential for mass transit development, but major transit projects generally draw largely from distinct (non-highway) federal funding sources. Major transit projects may draw upon Surface Transportation Program funding that is usually used for highway purposes. However, there is most often a capital expenditure on the part of the Federal Transit Administration through "new start" funding authorized by Congress separately from highway funds. Normally this comes only when there is a substantial commitment on the part of local and/or regional government to provide on-going funding to support transit development. Efforts continue through the Detroit Area Regional Transportation Authority (DARTA) to advance transit. MDOT supports DARTA's efforts.

The proposal to braid the ramps from I-696 to northbound I-75 with the northbound exit ramp to 11 Mile Road (to improve safety and traffic flow) resulted in several concerns that emerged after the public hearing. The original proposal would have eliminated the ability to exit from the northbound I-696 ramps to 11 Mile Road, requiring travel further north to 12 Mile Road or use of one of several other available travel paths. These changes in travel paths generated concerns about: 1) increases in traffic in south Royal Oak near the Mohawk exit from I-696; 2) reduction of traffic causing business loss for businesses on 11 Mile Road in Royal Oak and Madison Heights; and, 3) inhibition of emergency vehicle mobility to and across I-75. There was also concern on the part of Royal Oak and some of its residents about traffic shifts and emergency response if the 4th Street ramp to southbound I-75 were shifted north as a safety/traffic flow improvement. The proposed shift would have prohibited access from 4th Street to I-75.

Additional analysis resulted in a modification of the braid proposed in the DEIS. The modification would maintain access to 11 Mile Road from I-696. Further study of the 4th Street ramp found that access to the ramp could be maintained.

The Michigan Department of Environmental Quality (MDEQ) supports a quantitative assessment of emissions, impacts, and risk characterization for select air toxics, plus an impact analysis of $PM_{2.5}$.

These issues and the responses to them are discussed in Section 3.9, Preferred Alternative, and Sections 6.3 and 6.4, which cover public involvement and agency comments.

[23] Michigan Department of Transportation's *Procedures and Rules for Implementation of the State Transportation Commission Policy 10136 – Noise Abatement*, July 2003.
[24] *Improving Transit in Southeast Michigan: A Framework for Action*, SEMCOG, October 2001.

1.5 Permits

Proposed construction activities will involve the need for permits. Impacts on bodies of water such as rivers, drains, and wetlands will require permits under federal and state law:

- Federal Executive Order 11990 protects wetlands.
- The federal Clean Water Act of 1977, as amended requires: state Water Quality Certification of projects (Section 401); permitting of the quality of storm water (Section 402(p) - National Pollutant Discharge Elimination System); and, avoidance, minimization, and mitigation of wetland impacts (Section 404).
- Michigan Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, Part 31, Water Resource Protection, regulates placement of fill material within any part of a floodplain with a drainage area of two square miles or more.
- PA 451, Part 301, Inland Lakes and Streams, regulates work below the ordinary high-water mark of any inland lake, stream, or drain, including the placement of any permanent or temporary river or stream structure.
- PA Act 451, Part 303, Wetland Protection, regulates any wetland disturbance, permanent, as well as temporary. The Part 303 permit is reviewed and issued as a single permit that also includes Part 301 and Part 31.
- PA Act 451, Part 365, Endangered Species Protection, is required from the MDNR Wildlife Division for any activity that may affect a state-listed threatened or endangered fish, plant, or animal species. No endangered or threatened species were found; however, if any were identified during project implementation, all activity in the immediate area would cease. Coordination with the U.S. Fish and Wildlife Service would be initiated as required by Section 7 of the Endangered Species Act of 1973, and appropriate state and federal permits would be sought.

Final mitigation measures proposed in areas requiring the above permits will be developed in consultation with the appropriate agencies, and will be included in the permit application for implementing the project.

Permits will also be required where Oakland County Roads are involved and where Oakland County drains are involved. These come from the Road Commission for Oakland County and the Oakland County Drain Commission, respectively.

1.6 Project Status

This project is listed as a study in MDOT's approved *2004-2009 Five-Year Transportation Program*, which outlines roadway expenditures over the next five years.

It is on SEMCOG's *2030 Regional Transportation Plan (RTP)*, with construction scheduled for the 2011-2015 time period. With its inclusion on the plan, it is shown to be in conformity with the Clean Air Act. After this Final EIS is completed, a Record of Decision (ROD) for the project will be requested. Its signing allows the project to advance to design. However, due to the Governor's "Preserve First" program, the design phase for this project has been deferred. It is expected that by 2008, the condition goals would have been met and the project can move into design. Construction funding has not yet been identified.

Due to modifications that are recommended at the I-696 interchange and 12 Mile Road, an Interstate Break-in-Access Justification Report (IAJR) is being prepared to document the effect of the proposed access changes on the interstate system and affected local roads. Analysis performed for that report has been incorporated into this FEIS.

SECTION 2
PURPOSE AND NEED FOR ACTION

This section sets forth the purpose of the proposed action, including a brief history of activity related to the corridor, then explains in greater detail the need for the project in terms of existing and projected travel demand, existing road conditions on I-75, the physical condition of bridges that do not meet modern engineering design standards, and safety issues.

2.1 Purpose of the Proposed Action

The purpose of the proposed project is to increase the capacity of the transportation infrastructure in the I-75 corridor to meet travel demand for personal mobility and goods movement.

Meeting the purpose of the project will improve motorist safety, travel efficiency, and reliability. These are essential both to personal mobility and to the movement of freight.

I-75 will continue to play a role as a link in the nation's national system of Interstate and Defense Highways. I-75 connects Detroit and its international border crossings with the expanding economic development in Oakland County. Oakland County has the largest employment base of any county in Michigan and the most manufacturing plants, and is home to over 65 percent of the Detroit Metropolitan Statistical Areas[25] major automotive equipment suppliers. I-75 also links the Southeast Michigan region with the rest of the state to the north. It is the sole means of high-speed freight movement to a large section of Michigan, as it is the only freeway that extends to the north state limit and freight rail coverage is limited.

2.1.1 Project Background

I-75 is a transcontinental highway connecting Miami, Florida, and Sault Ste. Marie, Michigan. It is a vital component of the overall transportation system in Michigan and the United States. In Michigan, I-75 is the major north-south highway, connecting with other freeways in 16 locations. Within the project area, I-75 provides important access to the cities of Hazel Park, Ferndale, Madison Heights, Royal Oak, Troy, Bloomfield Township, Auburn Hills, and Pontiac. In the study area, I-75 connects with the following state trunklines: M-102 (8 Mile Road), I-696, I-75 BL/BR 24 (Square Lake Road), and M-59.

I-75 was laid out in a stair-step manner following section and property lines to minimize impacts to what development existed at that time (1960s). Its northwest/southeast orientation was designed to roughly parallel Woodward Avenue (M-1) and Dixie Highway (U.S. 24 in portions), serving destinations separated by long distances such as Flint and points north. The diagonal orientation of I-75 forces it to act, in some measure, as a local roadway. It is used by many Oakland County residents and workers for intra-county/local trips. The north/south and east/west local roadway grid system does not serve I-75 travel needs well and does a poor job of providing alternative, direct access between development nodes that have been created along the diagonal of I-75.

[25] Metropolitan statistical areas consist of one or more counties, as defined by the US Census for a variety of analysis purposes. The Detroit MSA consists of Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties.

In December 1991, the *I-75 Corridor Study for Northern Oakland County*[26] was completed. It identified roadway needs and costs in northern Oakland County in response to rapid growth in the I-75 corridor. It also summarized land use tools available to manage growth. The project report was used as a blueprint for regional roadway development in subsequent years. Since the 1991 study, progress has been made in meeting transportation needs by the Road Commission for Oakland County, MDOT, and local jurisdictions and agencies. Roads have been widened, signal timings have been improved and coordinated, and turning lanes have been added.

The 1991 study was stimulated, in part, by anticipated development in the area, including the Great Lakes Crossing Mall. Development throughout Oakland County made it evident that the comprehensive examination of transportation needs applied to northern Oakland County in the 1991 study needed to be extended to I-75 throughout the county.

In November 2000, a second study called the *I-75 Corridor Study in Oakland County*[27] was completed. That study devised an overall strategy of improvements to I-75, plus the local transportation network complementing it in Oakland County. The study recommended adding a lane in each direction to I-75 throughout Oakland County in areas where there were fewer than four through lanes per direction. The study also recommended improvements to interchanges, improvements to arterial streets, ITS improvements, and a study of how the transit infrastructure could be strengthened and expanded to improve transit's share of travel in the I-75 corridor. The 2000 feasibility study led to the development of this EIS.

2.2 Need for the Proposed Action

I-75 was built in the 1960s. Other sections of I-75 in Southeast Michigan have been reconstructed. By the time this project can be constructed, it will require major reconstruction. This reconstruction is a part of the project. The project need for increased corridor capacity is driven by the growth that has occurred along I-75 since its original construction. The reasons for land use change, are noted in Section 1.3.3. Migration of people and jobs to Oakland County has increased travel demand. The most important factors influencing traffic volumes are population and employment (Tables 2-1 and 2-2). The following subsections present population and employment trends that are relevant to existing and future traffic volumes in the project area. Decreased household size, more women in the work force, and longer commutes have also increased overall travel demand.[28]

2.2.1 Population and Employment Growth

There has been extensive growth in Oakland County in both employment and population and a shift in population and employment north from Detroit and its closest suburbs. Between 1980 and 1990, the population of Oakland County increased seven percent from 1,012,000 to 1,084,000. By 2000, it had increased nearly 10 percent more to 1,194,000. It is expected to grow an additional 13 percent to 1,346,000 over the next 30 years. Employment increased by 34 percent from 681,000 to 910,000 over the last decade. It is expected to grow by an additional 19

[26] *I-75 Corridor for Northern Oakland County*, The Corradino Group for the Michigan Department of Transportation, December 1991.
[27] *I-75 Corridor Study in Oakland County*, The Corradino Group for the Michigan Department of Transportation, the Southeast Michigan Council of Governments, the Road Commission for Oakland County and the Traffic Improvement Association, November 2000.
[28] *2025 Regional Transportation Plan*, Southeast Michigan Council of Governments, June 2000.

Table 2-1
Oakland County I-75 Corridor - Population 1980 to 2030

	POPULATION				PERCENT CHANGE		
PLACE	1980	1990	2000	2030 est.	80 to 90	90 to 00	00 to 30
Hazel Park	20,914	20,051	18,963	15,860	-4.1%	-5.4%	-16.4%
Ferndale	26,227	25,084	22,105	17,880	-4.4%	-11.9%	-19.1%
Madison Heights	35,375	32,196	31,101	26,564	-9.0%	-3.4%	-14.6%
Royal Oak	70,893	65,410	60,062	52,233	-7.7%	-8.2%	-13.0%
Troy	67,102	72,884	80,959	77,046	8.6%	11.1%	-4.8%
Bloomfield Township	42,876	42,473	43,023	39,180	-0.9%	1.3%	-8.9%
Pontiac	76,715	71,166	66,337	75,544	-7.3%	-6.7%	13.9%
Pontiac Township/ Auburn Hills[a]	15,388	17,076	19,837	21,013	11.0%	16.2%	5.9%
Orion Township	19,566	21,019	30,748	40,948	7.4%	46.3%	33.2%
Independence Township	20,569	23,717	32,581	38,103	15.3%	37.4%	16.9%
Springfield Township	8,295	9,927	13,338	20,326	19.7%	34.4%	52.4%
Holly Township	3,612	3,257	3,902	7,167	-9.8%	19.8%	83.7%
Groveland Township	4,114	4,705	6,150	7,239	14.4%	30.7%	17.7%
Corridor Total	411,646	408,935	429,106	439,103	-0.7%	4.9%	2.3%
Oakland County	1,011,793	1,083,592	1,194,156	1,346,185	7.1%	10.2%	12.7%
Michigan	9,262,044	9,295,287	9,938,444	NA	0.4%	6.9%	NA

Source: *Historical Population and Employment by Minor Civil division, Southeast Michigan*, SEMCOG, June 2002
[a] Auburn Hills was incorporated in 1983 from Pontiac Township

Table 2-2
Oakland County I-75 Corridor - Employment 1990 to 2030

	EMPLOYMENT			PERCENT CHANGE	
PLACE	1990	2000	2030 est.	90 to 00	00 to 30
Hazel Park	5,003	4,883	4,099	-2.4%	-16.1%
Ferndale	10,577	11,312	11,173	6.9%	-1.2%
Madison Heights	27,407	28,848	27,538	5.3%	-4.5%
Royal Oak	34,871	42,252	43,583	21.2%	3.2%
Troy	104,494	135,977	144,882	30.1%	6.5%
Bloomfield Township	15,013	24,943	33,161	66.1%	32.9%
Pontiac	56,308	63,070	76,787	12.0%	21.7%
Pontiac T./Auburn Hills[a]	22,202	54,253	77,684	144.4%	43.2%
Orion Township	7,379	9,057	17,232	22.7%	90.3%
Independence Township	4,445	7,725	10,990	73.8%	42.3%
Springfield Township	1,244	2,685	6,805	115.8%	153.4%
Holly Township	326	815	1,789	150.0%	119.5%
Groveland Township	417	926	2,143	122.1%	131.4%
Corridor Total	289,686	386,746	457,866	33.5%	18.4%
Oakland County	681,037	910,441	1,087,399	33.7%	19.4%
Michigan	4,826,388	5,654,522	NA	17.2%	NA

Source: *Historical Population and Employment by Minor Civil division, Southeast Michigan*, SEMCOG, June 2002
[a]Auburn Hills was incorporated in 1983 from Pontiac Township

percent to about 1,100,000 over the next 30 years.[29] In 2020 Oakland County is expected to have nearly 19 percent of the state of Michigan's total employment and more than 29 percent of its total earnings.[30]

I-75 is used by Oakland County commuters and by through travelers, including truckers carrying goods to points north in Michigan. When I-75 was built, urban land uses extended north only to about 12 Mile Road. As development expanded northward, it focused around I-75's interchanges, without the support of a local grid of arterial streets. Thus, I-75 became the only good way to get to many major traffic generators.

The major traffic generators that developed along I-75 include: the Oakland and Somerset Malls; many large office buildings (especially at Big Beaver Road and Crooks Road), including many corporate headquarters; the Palace of Auburn Hills; and the Pontiac Silverdome.

2.2.2 Existing Traffic and Level of Service

The *Traffic Analysis Report*[31] confirms the need for four through travel lanes throughout the project length. Level of Service (LOS) is a standard measure that reflects the degree of congestion and amount of delay experienced by motorists. LOS is expressed as a letter between A and F. LOS A represents a situation where motorists experience minimal congestion, minimal delays, and free flow travel conditions. LOS F represents a situation where motorists experience extreme congestion, long delays, and severely impeded traffic flows. Generally LOS D, i.e., some congestion, is considered the minimally acceptable LOS for freeways, except in urbanized areas, as is the case with I-75, where LOS E is acceptable in peak travel periods. With LOS E traffic flow is continuous, but speeds and maneuverability are reduced.

I-75 in the project area operates from LOS C (light congestion) to LOS F (extremely congested) along the mainline during today's peak periods (Table 2-3 and Figures 2-1 and 2-2). Generally the peaks today are from 6:30 to 8:30 AM and 3:30 to 6:30 PM (the afternoon peak is generally longer than the morning peak). Truck percentages range from five to eight percent of daily traffic. Volumes on I-75 are relatively balanced for the northbound and southbound directions of travel. Furthermore, they are relatively consistent from 6 AM to 8 PM each weekday. This means the full capacity of the road is currently being used.

Analysis of today's LOS for each freeway segment by direction used the latest software from the Transportation Research Board *Highway Capacity Manual 2000* (HCM), Chapters 23 and 25, and 2002 traffic counts from MDOT.[32] Considering both northbound and southbound conditions in the PM peak hour, the analysis determines the LOS would be F (extremely congested) for four segments, as noted by shading in Table 2-3. The situation is similar in the AM peak. Crashes on I-75 (an average of 3.3 per day) add to delays and lane blockages that are not modeled. It is clear that I-75 operates at severe congestion levels, if not at breakdown conditions (LOS F), in the three-lane sections during the existing peak traffic periods. The result is reduced overall speeds,

[29] *2030 Regional Development Forecast for Southeast Michigan*, Southeast Michigan Council of Governments (SEMCOG), 2001.
[30] *1999 State Profile; Michigan*, Woods and Poole Economics, Inc.
[31] *Traffic Analysis Report*, The Corradino Group, November 2003.
[32] MDOT does ramps counts less frequently, so data ranges from 1997 to 2002.

queuing, and lower observed volumes. This hinders just-in-time delivery for truckers and can delay goods movement within the region and much of Michigan to the north.

Table 2-3
Existing (2002) Peak Hour Traffic Volumes and LOS for I-75

SEGMENT	AM PEAK				PM PEAK			
	VOLUME		LOS		VOLUME		LOS	
	NB	SB	NB	SB	NB	SB	NB	SB
8 Mile Road to 9 Mile Road	4,030	5,260	C	C	5,850	5,370	D	D
9 Mile Road to I-696	4,670	5,600	C	D	6,220	6,060	D	D
I-696 to 11 Mile Road	4,670	6,000	C	E	6,300	6,080	D	E
11 Mile Road to 12 Mile Road	5,210	4,800	F	F	5,900	5,050	F	F
12 Mile Road to 14 Mile Road	5,550	4,380	E	D	5,830	4,500	E	D
14 Mile Road to Rochester Road	5,110	4,040	D	C	4,840	4,300	D	D
Rochester Road to Big Beaver Road	4,710	3,940	D	C	4,120	4,210	D	D
Big Beaver Road to Crooks Road	4,180	4,810	D	D	3,850	4,000	C	C
Crooks Road to Adams Road	3,460	4,980	C	D	3,790	3,640	C	C
Adams Road to Square Lake Road	3,590	5,080	F	F	4,240	3,110	F	F
Square Lake Road (I-75 BL) to M-59	4,720	6,140	C	D	6,090	4,150	D	C

Source: The Corradino Group of Michigan, Inc.

2.2.3 Future Traffic and Level of Service

In order to assess the need for the project, i.e. the build alternatives, SEMCOG's model, as modified by the consultant to account for the analysis of afternoon peak hour conditions as well as transit and HOV testing, was used to forecast traffic conditions with and without the Preferred Alternative for the year 2025. The No Build Alternative assumes that projected population and employment growth will occur, and that committed/cost-feasible road improvements will be built, but that no capacity improvements will be made to I-75 within the project area, other than normal maintenance. The year 2025 was selected because projects constructed with federal funds must address traffic needs projected for at least 20 years into the future.[33] These projections demonstrate that in 2025, without improvements, I-75 will experience severe congestion throughout the project length (Table 2-4 and Figures 2-1 and 2-2). In the AM peak hour, LOS F would be experienced in five segments (shaded in the table). In the PM peak, the situation would be worse with 10 segments at LOS F.

With the project, one lane would be added where needed to bring I-75 to four through lanes between M-102 and M-59 (Table 2-5). It already provides four through lanes to the north and south of these points. In the AM and PM peak hours, there would be no segments where LOS F is expected in either direction. In both peak periods, 13 segments would be at LOS D and either three (AM peak) or four (PM peak) would be LOS E. These are acceptable conditions under limited circumstances in the constrained urban situations.

[33] SEMCOG is updating the horizon year of region's transportation model to 2030, but that work is not sufficiently complete to be used in this EIS.

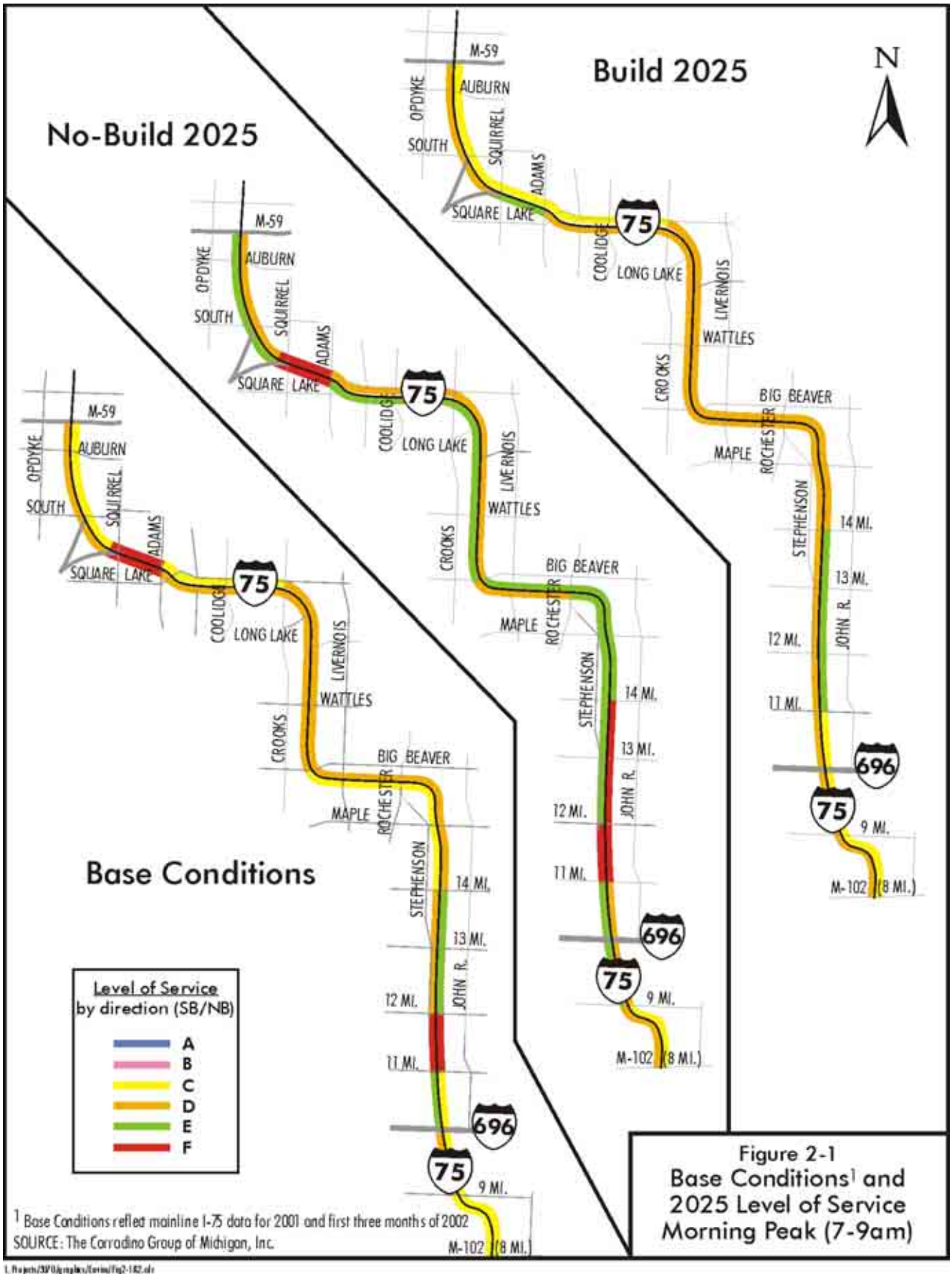

Figure 2-1
Base Conditions[1] and
2025 Level of Service
Morning Peak (7-9am)

[1] Base Conditions reflect mainline I-75 data for 2001 and first three months of 2002
SOURCE: The Corradino Group of Michigan, Inc.

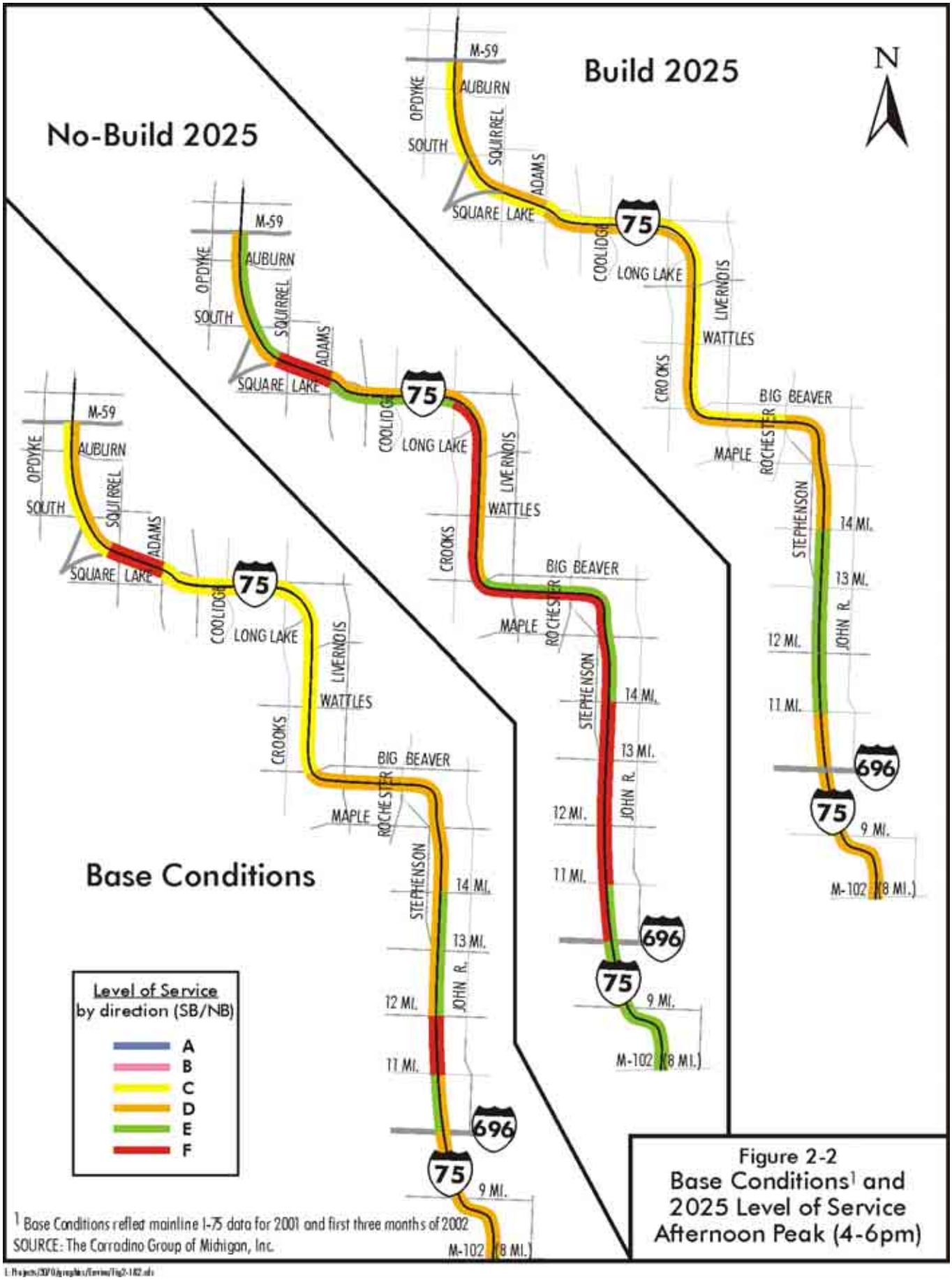

Figure 2-2
Base Conditions[1] and
2025 Level of Service
Afternoon Peak (4-6pm)

[1] Base Conditions reflect mainline I-75 data for 2001 and first three months of 2002
SOURCE: The Corradino Group of Michigan, Inc.

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Table 2-4
2025 Peak Hour Traffic Volumes and LOS for I-75 – No Build Alternative

SEGMENT	AM PEAK				PM PEAK			
	VOLUME		LOS		VOLUME		LOS	
	NB	SB	NB	SB	NB	SB	NB	SB
8 Mile Road to 9 Mile Road	5,000	6,790	C	D	7,190	7,450	E	E
9 Mile Road to I-696	5,640	7,130	D	E	7,560	8,140	E	E
I-696 to 11 Mile Road	5,670	7,530	D	E	7,640	8,410	E	F
11 Mile Road to 12 Mile Road	6,140	6,250	F	F	7,240	7,380	F	F
12 Mile Road to 14 Mile Road	6,520	5,870	F	E	7,220	6,740	F	F
14 Mile Road to Rochester Road	6,080	5,420	E	E	6,180	6,590	E	F
Rochester Road to Big Beaver Road	5,800	5,050	E	D	5,460	6,710	E	F
Big Beaver Road to Crooks Road	5,140	6,130	D	E	5,300	6,500	D	F
Crooks Road to Adams Road	4,240	6,220	D	E	5,040	6,055	D	E
Adams Road to Square Lake Road	4,400	6,350	F	F	5,530	5,555	F	F
Square Lake Road (I-75 BL) to M-59	5,810	7,670	D	E	7,380	6,555	E	D

Source: The Corradino Group of Michigan, Inc.

Table 2-5
2025 Peak Hour Traffic Volumes and LOS for I-75 – Build Alternatives

SEGMENT	AM PEAK				PM PEAK			
	VOLUME		LOS		VOLUME		LOS	
	NB	SB	NB	SB	NB	SB	NB	SB
8 Mile Road to 9 Mile Road	6,030	7,185	C	D	7,280	7,900	D	D
9 Mile Road to I-696	6,740	7,525	C	D	7,690	8,640	D	D
I-696 to 11 Mile Road	6,740	7,925	C	D	7,850	9,015	D	D
11 Mile Road to 12 Mile Road	7,340	6,645	E	D	7,540	8,045	E	E
12 Mile Road to 14 Mile Road	7,690	6,145	E	D	7,450	7,355	E	E
14 Mile Road to Rochester Road	6,935	5,860	D	D	6,220	6,855	D	D
Rochester Road to Big Beaver Road	6,655	5,490	D	D	5,450	6,965	C	D
Big Beaver Road to Crooks Road	6,195	6,570	D	D	5,110	6,745	C	D
Crooks Road to Adams Road	4,895	7,240	C	D	5,360	5,745	C	D
Adams Road to Square Lake Road	5,055	7,370	C	E	5,830	5,055	D	C
Square Lake Road (I-75 BL) to M-59	6,465	8,690	C	D	7,470	5,855	D	C

Source: The Corradino Group of Michigan, Inc.

2.2.4 I-75 and Existing Design Standards

I-75 was built in the 1960s to design standards of that time. This section discusses the relationship of the existing road to current design standards. Section 3 discusses how the Preferred Alternative will address those areas where I-75 falls short of today's standards. Table 2-6 identifies locations where I-75 does not meet modern standards, based on a review of existing design plans for the road. Specific features include:

Table 2-6
Existing I-75 Roadway Features in Relation to Modern Standards

ISSUE	LOCATION RELATIONSHIP TO MODERN STANDARDS	FEATURE	COMMENTS
HORIZONTAL ALIGNMENT	I-75, south of John R. bridge (between Meyers & Highland)	Superelevation rate	Existing superelevation @ 5% is insufficient for 70 mph design speed (required 7%).
	I-75, south of John R. bridge (between Highland & Rhodes)	Superelevation transition length	Existing transition length between superelevated sections not to standard.
	I-75, north of John R. bridge (between Rhodes & 9 Mile Road) [a]	Superelevation rate Length of curve Radius of curvature	Existing radius of 1315' with existing 5% superelevation is insufficient. 1922' radius is required for desired[a] 7% superelevation
	I-75, northbound at Gardenia	Superelevation rate Radius of curvature	Existing radius of 2360' with existing 5% superelevation is insufficient. 1922' radius is required for desired[a] 7% superelevation.
	I-75, southbound at Gardenia	Superelevation rate Radius of curvature	Existing radius of 2360' with existing 5% superelevation is insufficient. 1922' radius is required for desired[a] 7% superelevation
	I-75, bridge over 12 Mile Road	Superelevation rate Length of curve Radius of curvature	Existing radius of 1932' with existing 5% superelevation is insufficient. 1922' radius is required for desired[a] 7% superelevation
	I-75, north of Maple Mile Road thru Rochester Road	Superelevation rate	Existing superelevation @ 5% is insufficient for 70 mph design speed (required 6.3%).
	I-75, Livernois Road thru north of Big Beaver Road	Superelevation rate	Existing superelevation @ 5% is insufficient for 70 mph design speed (required 6.3%).
	I-75, north of Big Beaver Road thru Squirrel Road	Superelevation rate	Existing superelevation @ 5% is insufficient for 70 mph design speed (required 6.3%).
	I-75, under Squirrel Road	Superelevation rate	Existing superelevation @ 2% is insufficient for 70 mph design speed (required 7%).
	I-75, bridge over Clinton River	Superelevation rate	Existing superelevation @ 5% is insufficient for 70 mph design speed (required 6.1%).
	I-75, Squirrel Rd. thru South Boulevard	Superelevation rate	Existing superelevation @ 5% is insufficient for 70 mph design speed (required 6.3%).
	Grades along I-75 from M-102 (8 Mile Road) to M-59	Longitudinal grades	All locations meet minimum and maximum criteria for longitudinal grades (min 0.3%, max 3.0%).
VERTICAL AND CLEARANCE ALIGNMENT	I-75, under John R. bridge I-75, under 9 Mile Road bridge	Length of vertical curve (sag) at these two locations	Two consecutive sag vertical curves, existing length of either curve is less than standard for 70 mph design speed.
	I-75, north of Meyers Avenue I-75, north of John R. I-75, north of 9 Mile Road on-ramps I-75, at 4th Road	Length of vertical curve (crest) at these four locations	Crest vertical curve, existing length of curve is less than standard for 70 mph design speed.

[a] See MDOT Standard Plan R-107.

Table 2-6 (continued)
Existing I-75 Roadway Features in Relation to Modern Standards

ISSUE	LOCATION RELATIONSHIP TO MODERN STANDARDS	FEATURE	COMMENTS
STOPPING SITE DISTANCE	I-75, north of 8 Mile Road, south of Meyers Avenue I-75, under Meyers Avenue bridge I-75, north of Meyers Avenue bridge I-75, under John R. bridge I-75, north of John R. bridge I-75, under 9 Mile Road bridge I-75, north of 9 Mile Road bridge I-75, south of Woodward Heights Bridge I-75, at Woodward Heights Bridge I-75, at Middlesex Road I-75, under 11 Mile Road bridge I-75, under Squirrel Road bridge I-75, at merger of 9 Mile Road on-ramp I-75, at merger of 11 Mile Road on-ramp	Stopping sight distances are not met at these 14 locations	Stopping sight distance for crest curve is less than standard for 70 mph design speed.
CROSS SECTION	Eight Mile to Twelve Mile	None	Existing pavement width and shoulder width meet modern standards.
RAMP EXIT AND ENTRANCE DESIGN	West side of I-75, north of Eight Mile Road West side of I-75, south of John R. Road West side of I-75, north of Nine Mile Road East side of I-75, north of Nine Mile Road West side of I-75, south of Eleven Mile Road East side of I-75, south of Eleven Mile Road West side of I-75, north of Eleven Mile Road East side of I-75, north of Eleven Mile Road 12 Mile Rd. 14 Mile Rd. Rochester Rd. Adams Rd	Ramp exits and entrances do not meet modern standards at these 12 locations.	Profile grades, vertical curves, decision sight distances, and transition lengths do not meet modern standards.
RAMP SPACING	Eight Mile to Twelve Mile	None	Ramp spacing meets modern standards.

Source: The Corradino Group of Michigan, Inc., OHM, and Rowe, Inc. based on MDOT Design Plans (1960s)

- Horizontal alignment
- Vertical clearance and alignment
- Stopping sight distance
- Cross section
- Ramp exit and entrance design
- Ramp spacing

Speed limits on I-75 are now posted at 65 mph from M-102 to Square Lake Road and 70 mph north of this point. There is advisory signing through the 9 Mile curve of 50 mph and through the Rochester curve of 55 mph. No change in posted speed limits is anticipated with the Preferred Alternative. The anticipated design speed for the project is 70 mph. Clear width information is included on a table in Appendix A.

Horizontal Alignment

The horizontal alignment of a road encompasses the radii of curves (i.e., how "sharp" a curve is), their length, and superelevation (i.e., the vertical distance between the heights of the inner and outer edges of the road or how the freeway is "banked"). The steepness of the banking – superelevation - is related to the sharpness of the curve and the design speed. The standards are set to maximize the safety of the curves for a given curve radius and design speed. There are more than 20 locations in the study area where I-75 does not meet modern standards for superelevation rates, superelevation transition lengths, and radius of curvature. These inadequacies reduce travel efficiency and safety, and may cause some vehicles to travel slower. Minor changes in curve radii together with superelevation increases will bring all locations to full, modern standards, except the 9 Mile Road curve (Section 3.7).

Vertical Clearance and Alignment

Vertical clearance is defined as the distance between the surface of the roadway (including shoulders) and the bottom of an overhead bridge structure. Poor (substandard) bridge clearances occasionally result in trucks crashing into bridge beams and require some larger trucks to take alternate routes. Modern standards require a vertical clearance for bridges over I-75 of 16'0". The proposed I-75 reconstruction will meet this standard north of I-696. South of I-696, the clearance is allowed to be 14'6" as the interstate system in the core of Detroit is held to an earlier standard. Vertical underclearance of pedestrian bridges over service drives in the depressed section of the corridor will be 17'0" (one foot above the structure height). This allows an extra margin of safety for the pedestrian bridges.

The road's alignment includes vertical grade (i.e., how steep hills are), vertical curves (i.e., the sharpness of crests of hills and dips), and vertical sight distance. These issues affect travel efficiency, traffic congestion, and safety. In the study area, I-75 meets modern standards for vertical grade and vertical sight distance, except two locations where the sags (dips) and four locations where the crests on I-75 do not meet the modern standards for the length of vertical curves. These occur in the depressed section of freeway. They will be fixed with the Preferred Alternative by modifying the roadway profile. The roadway profile is set by the need to go under bridges, and then to rise in order to connect to on and off-ramps. Changing the profile of the mainline will require changing the profile of the ramps.

Decision Site Distance and Stopping Site Distance

Stopping sight distance is the distance a motorist must be able to see in order to stop safely should an object or other threat require. As speeds increase, stopping sight distance requirements also increase. Normally, the stopping sight distance is an adequate sight distance for roadway design.[34] However, there are cases where it may not be appropriate. In areas where information about navigation or hazards must be observed by the driver, or where the driver's visual field is cluttered, the stopping sight distance may not be adequate. In addition, there are avoidance maneuvers that are far safer than stopping, but require more planning by the driver. These may not be possible if the minimum stopping sight distance is used for design. In these instances, the proper sight distance to use is the decision sight distance.

The decision sight distance is the distance traversed while: 1) recognizing an object or hazard; 2) plotting an avoidance course; and, 3) making the necessary maneuvers.

There are 14 areas where stopping sight distances do not meet modern standards. Two of these 14 areas also do not meet the standard for decision sight distance due to merging ramp traffic. All of these deficiencies will be addressed by changing the roadway profile.

Cross Section

The cross section of a road includes travel lane width, shoulder width (both inside and outside shoulders), median width, the cross slope of the travel lanes, shoulder slope, cut/fill slopes, and the ditch slopes. In the project area, the I-75 cross section meets modern standards. With the addition of a fourth through lane in each direction, the I-75 cross section will continue to meet modern standards. (See a discussion of 10-foot versus 12-foot median shoulders in Section 3.7.3.)

Ramp Exit and Entrance Design

Ramp designs do not meet modern standards at 12 locations. The decision sight distances (see definition above) and/or ramp acceleration/deceleration lengths are inadequate. These conditions result in difficult merge conditions and may contribute to crashes. These deficiencies will be addressed by improving the vertical profile of ramps, adjusting obstacles that interfere with sight distance (such as bridge supports), and/or providing longer acceleration or deceleration lanes.

Ramp Spacing

In urban settings, interchanges are typically spaced at least one mile from each other, as required by the Federal Highway Administration (FHWA). This spacing is required to provide adequate distance for motorists to perform merges and exit safely and efficiently. Inadequate interchange separation can create "weaving" conflicts between motorists entering and exiting the freeway. These conflicts result in traffic congestion and may contribute to crashes, in some situations. I-75 interchange ramp spacing meets modern standards in the project area. However, heavy volumes and weaving movements cause problems and necessitate the need for braiding north of I-696. Braiding allows one ramp to pass over another so the traffic from the two are not in conflict.

[34] http://www.webs1.uidaho.edu/niatt_labmanual/Chapters/geometricdesign/theoryandconcepts/

2.2.5 Physical Condition and Relative Performance of I-75

The condition of the existing roadway and of some bridges contribute to the need for the project. Because of the age of this roadway (built in the 1960s), it will require major reconstruction. This will have to occur with or without the proposed project. MDOT monitors its roadway system, in part, by means of "sufficiency ratings." Every trunkline roadway segment is scored based on the condition of its surface pavement, the condition of the roadway base on which that pavement rests, the roadway's crash experience, and its capacity (Table 2-7). The four ratings are summed and compared to a possible total of 100 points. In this case no data are available in the sufficiency ratings on crash experience ratings, so this category has been dropped and the totals must be compared to a maximum of 70 total points. See the discussion of crashes below (Section 2.6.6), which is based on the most recent data. A variety of locations show need with respect to crash experience.

Table 2-7
Existing I-75 Sufficiency Ratings

	NORTHBOUND I-75				SOUTHBOUND I-75			
	Surf.	Base	Cap.	Total	Surf.	Base	Cap.	Total
MAXIMUM POSSIBLE POINTS	25	15	30	70	25	15	30	70
Link Start Point								
M-102 (8 Mile Road)	8	15	8	31	8	15	8	31
9 Mile Road	8	15	7	30	8	15	7	30
I-696	8	15	8	31	6	15	8	29
11 Mile Road	8	15	6	29	6	15	6	27
Gardenia Avenue	8	15	6	29	8	15	6	29
12 Mile Road	24	15	7	46	24	15	7	46
13 Mile Road	25	15	7	47	25	15	7	47
14 Mile Road	25	15	9	49	25	15	9	49
Rochester Road	25	15	12	52	25	15	12	52
Big Beaver Road	25	15	9	49	25	13	9	47
Crooks Road	25	15	8	48	25	15	8	48
Adams Road	25	15	8	48	25	15	8	48
South Limit Square Lake Rd.	24	15	6	45	25	15	6	46
North Limit Square Lake Rd.	25	15	17	57	25	15	11	51

Source: MDOT Sufficiency Ratings

The roadway base of I-75 is in good condition. The surface is likewise in good condition north of 13 Mile to M-59, as it was paved in summer 2003. Pavement conditions are poor south of 12 Mile Road. Paving of the segment from 8 Mile Road to 12 Mile Road is now planned for 2007 (MDOT's *2004-2009 Five-Year Transportation Program*). I-75 is consistently rated poor in capacity, scoring for the most part 6 to 8 on a scale of 30. The Preferred Alternative will substantially improve the capacity ratings. A preliminary evaluation of bridges is included in a table in Appendix A. A more detailed evaluation will be included in the next phase of the project.

2.2.6 Safety

A *Crash Analysis*[35] was prepared for this EIS. From January 1995 to the end of 2001, more than 8,500 crashes were reported on I-75 between M-102 (8 Mile Road) and M-59. Rear-end crashes were most common (58%), followed by single-vehicle (18%), sideswipe-same direction (14%), other/uncoded (5%), angle (3%), sideswipe-opposite direction (1%), and head-on (1%). There were 2,444 crashes with injuries, and 24 with fatalities. Alcohol was involved in 11 of the fatal crashes and two pedestrians were killed. Nine of the fatal crashes were rear-end, and an equal number were single-vehicle crashes. The fatal crashes involved three head-on, two angle, and one sideswipe/opposite direction incidents.

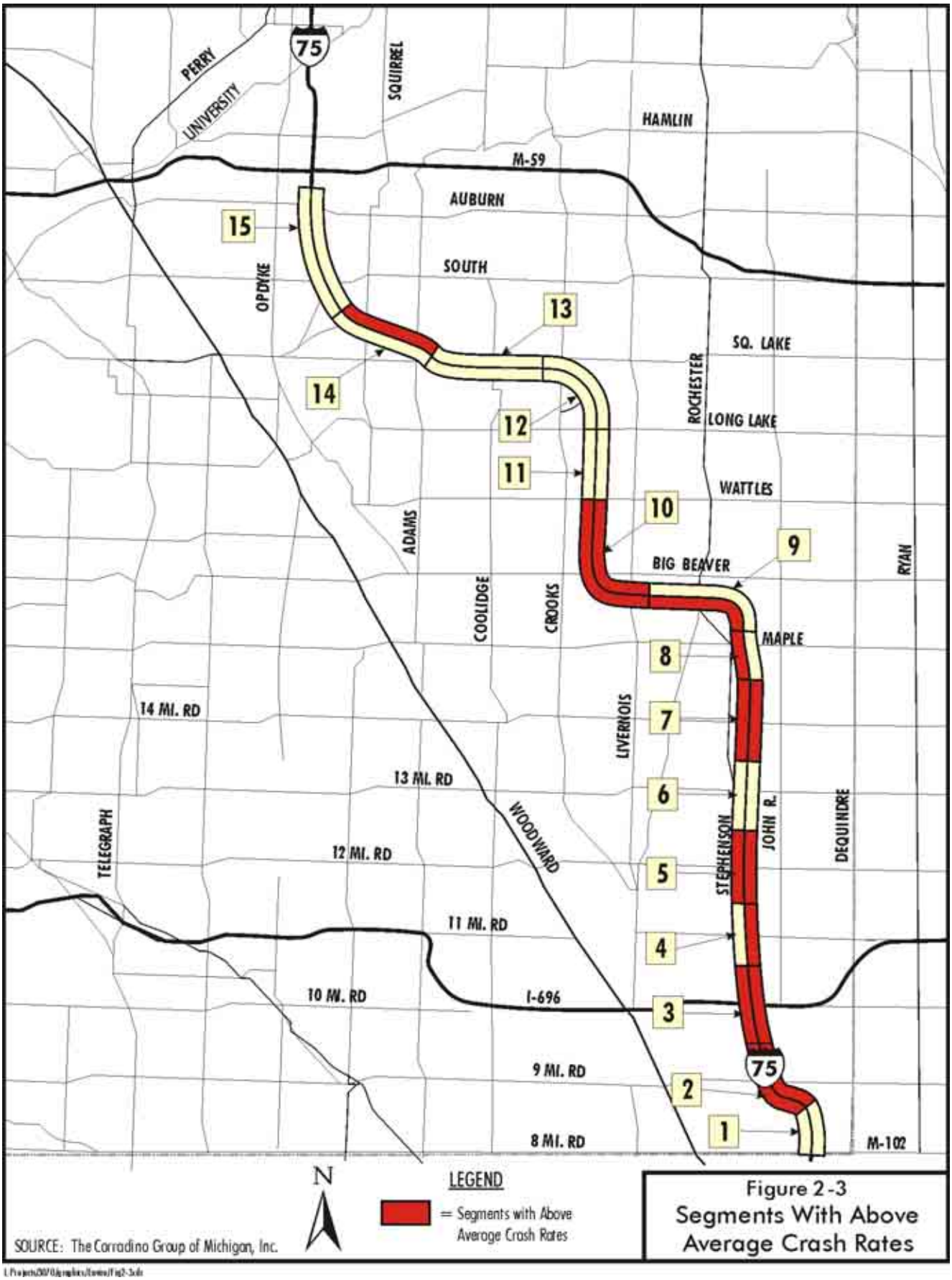
The average crash rate for the entire corridor is 1.31 crashes per million vehicle miles. The state average for urban freeways is 1.77 crashes per million vehicle miles.[36] For purposes of analysis, the corridor was divided into 15 segments (Figure 2-3). Segments with crash rates above 1.31 are in bold type in Table 2-8 and are discussed in the text. (Other segments are not discussed.) These segments were analyzed to determine whether crash countermeasures could improve safety. Details of the countermeasures are provided in the *Crash Analysis.*

Table 2-8
Crash Data by Segment

SEGMENT	SEGMENT OF I-75	EXISTING AADT[a]	NB[b]	SB[b]
1	8 Mile Road to South of 9 Mile Road	173,000	0.93	1.22
2	**South of 9 Mile Road to South of I-696**	182,000	***2.51***	***1.45***
3	**South of I-696 to North of I-696**	185,000	***2.44***	***1.41***
4	**North of 1-696 to South of 12 Mile Road**	187,000	***2.02***	1.26
5	**South of 12 Mile Rd. to North of 12 Mile Rd.**	186,000	***1.60***	***1.40***
6	North of 12 Mile Rd. to North of 13 Mile Rd.	175,000	1.00	0.87
7	**North of 13 Mile Rd. to North of 14 Mile Rd.**	158,000	***1.33***	***2.28***
8	**North of 14 Mile Rd. to North of Maple Rd.**	141,000	0.90	***1.61***
9	**North of Maple Road to East of Livernois**	127,000	0.86	***1.94***
10	**East of Livernois to Wattles Road**	119,000	***1.64***	***1.94***
11	Wattles Road to Long Lake Road	125,000	0.42	0.59
12	Long Lake Road to North of Crooks Road	120,000	0.74	0.60
13	North of Crook Road to South of Adams Road	116,000	0.55	0.30
14	**South of Adams Road to Square Lake Road**	119,000	***2.68***	0.67
15	Square Lake Road to M-59 Ramps	124,000	1.18	1.02

Source: The Corradino Group of Michigan, Inc., Traffic Improvement Association of Oakland County and MDOT
Note: Segments in **bold** were analyzed for crash countermeasures. See text.
[a] Average Annual Daily Traffic
[b] Crashes per million vehicle miles

[35] *Crash Analysis*, The Corradino Group, June 2003.
[36] *Comparison of Crash Rates and Characteristics in Eight States by Roadway Class*; Transportation Research Board, Paper Number 97, 1997.


75
PERRY
UNIVERSITY
SQUIRREL
HAMLIN
M-59
AUBURN
15
OPDYKE
SOUTH
13
SQ. LAKE
ROCHESTER
14
12
LONG LAKE
11
WATTLES
10
ADAMS
9
BIG BEAVER
RYAN
COOLIDGE
CROOKS
MAPLE
8
14 MI. RD
LIVERNOIS
7
13 MI. RD
6
TELEGRAPH
WOODWARD
JOHN R.
DEQUINDRE
12 MI. RD
STEPHENSON
5
11 MI. RD
4
10 MI. RD
I-696
3
75
9 MI. RD
2
1
8 MI. RD
M-102
N
LEGEND
= Segments with Above Average Crash Rates
SOURCE: The Corradino Group of Michigan, Inc.
Figure 2-3
Segments With Above Average Crash Rates

Superelevations will be improved with the project. Generally this means the "banking" of the curves will increase, tending to keep vehicles on the road better. Adding an additional lane of capacity will increase maneuverability. Lengthening acceleration and deceleration lanes, where feasible, will allow smoother merges and diverges (exits). This, in turn, will reduce lane shifts in congested ramp areas, which can reduce crashes. Other recommended countermeasures that appear to be feasible are related to improving sight distance, drainage, and vertical curves.

Countermeasures are summarized below by segment. Only those segments with crash rates above 1.31 per million vehicle miles of travel are discussed. Some countermeasures are considered short-term and some are considered long-term. Long-term measures will be considered for implementation during design of the Preferred Alternative. Short-term measures are those that could be implemented sooner, if funding becomes available.

Segment 2 - South of 9 Mile Road to South of I-696

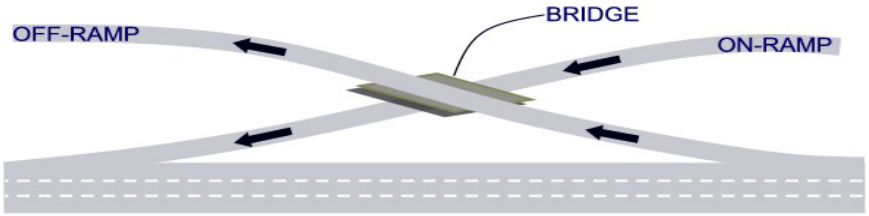
Northbound - Straightening the "S" curve at 9 Mile Road was analyzed, but is not considered reasonable because of significant socioeconomic impacts. Short-term measures include additional advance warning signs and flashers to slow excessive vehicle speeds at the curves. Also recommended are glare screens mounted on the median barrier to minimize or eliminate direct headlight glare from opposing traffic and "gawker" behavior when incidents occur in the opposite direction. Finally, soft attenuation or cushion walls on barriers would reduce the risk of severe injuries. In the long-term, resurfacing the pavement and improving the drainage will help with slick pavement conditions. Relocation to the south of the 8 Mile Road northbound on-ramp, and improving the entrance taper would improve safety. There is a spillback effect from the I-696 northbound on-ramps that will be discussed below.

Southbound – In the short term, additional advance warning signs and flashers would be appropriate to slow excessive vehicle speeds and warn drivers of the lane drop at 8 Mile Road. Glare screens would reduce or eliminate direct headlight glare and reduce gawker behavior. In the long-term, resurfacing and improving the drainage will help with slick pavement conditions. Relocation to the south of the 8 Mile Road southbound off-ramp, and improving the entrance taper would also reduce crashes.

Adding a lane will reduce the potential for crashes due to unexpected stopping and congestion in both directions.

Segment 3 - South of I-696 to North of I-696

Northbound - Adding a lane will reduce the potential for crashes due to unexpected stopping and congestion; however, this segment, like segment 2 above, has unexpected stopping resulting from the northbound merging traffic coming from I-696. Analysis finds that the northbound on-ramps from I-696 should be "braided" with the off-ramp to 11 Mile Road (see schematic on next page). Specifically, the on-ramps would bridge over the exiting off-ramp to 11 Mile Road. The off-ramp to 11 Mile Road would be relocated further south to accomplish the braid. The existing crossover bridge at Dallas Avenue would be removed because it conflicts with the braiding. It would shift north to a point near Lincoln Avenue. It is now a two-way bridge. In the future, it would serve east to west movements only. This improvement is planned as part of the Preferred Alternative. In the short term, advance signing would inform drivers of potential slowdowns and glare screens could minimize distraction from opposing traffic.



Example of Braided Ramps

Southbound - Adding a lane will improve operations and reduce the potential for crashes due to unexpected stopping and congestion associated with turbulent merging operations. Advance warning signs and glare screens are considered short-term measures.

Segment 4 – North of I-696 to South of 12 Mile Road

Northbound – As noted above, this segment of I-75 experiences crashes from turbulent merging operations that occur as two lanes from I-696 merge with mainline traffic and then exit to 11 Mile Road occur less than 2600' away. Adding a lane will reduce the potential for crashes due to unexpected stopping and congestion, but lengthening the merge/diverge area is also key. The recommended braiding allows this. The continuation of the glare screen through this segment would be a short-term measure.

Southbound - Adding a lane will improve operations and reduce the potential for crashes due to unexpected stopping and congestion associated with turbulent merging operations.

Segment 5 - South of 12 Mile Road to North of 12 Mile Road

Northbound – Reconstruction of the 11 Mile Road on-ramp will improve the merge length and sight distance. Glare screens would continue through the depressed part of this segment as a short-term measure. Reconstruction of the 12 Mile interchange will allow elimination of a poor crest vertical curve and lengthening of the merge ramps.

Southbound – Reconstruction of the 12 Mile Road interchange will lengthen the on-ramp, which is now shorter than desirable, and eliminate the loop ramp, which restricts acceleration to freeway speed.

Segment 7 - North of 13 Mile Road to North of 14 Mile Road

Northbound – Reconstruction of the 14 Mile Road interchange will lengthen the off-ramps for improved deceleration. This, with the lane capacity addition will reduce conflicts.

Southbound – Reconstruction of the 14 Mile Road interchange will lengthen the off-ramps for improved deceleration. This, with the lane capacity addition will reduce conflicts.

Segment 8 - North of 14 Mile Road to North of Maple

Southbound – The lane capacity addition will smooth traffic flow and aid in reducing the rear-end crashes that predominate in this segment (which are largely the result of downstream, e.g., 14 Mile Road, backups).

Segment 9 - North of Maple to East of Livernois

Southbound - The majority of the crashes in this segment occur at the Rochester Road on-ramp. They include rear-end, single-vehicle and sideswipe crashes at the merge point that results in part from the low entry speeds from the tight loop ramp. Lengthening this on-ramp will help reduce conflicts. This could be accomplished as a short-term measure.

Segment 10 - East of Livernois to Wattles Road

Northbound – Crashes occur at the Big Beaver Road exit and entrance ramps and through the curve at Big Beaver Road. A tall glare screen is recommended through the curve as a short-term measure. Full implementation of MDOT's ITS Information Management System in this segment could provide better advance warning of slowed conditions. In the long term, ramps should be lengthened.

Southbound – The southbound condition is similar. Adding capacity and lengthening ramps will help reduce conflicts.

Segment 14 - South of Adams to Square Lake Road

Northbound – Most crashes in this segment are rear-end, and likely reflect the lack of through capacity on northbound I-75 at Square Lake Road that was remedied in 2002. With the lane addition northbound at this location, the number of crashes, particularly rear-end, will decrease.

Ramps

Countermeasures could be implemented for several ramps as follows:

- I-696 to I-75 ramps – warning signs - "Congestion Ahead"
- Big Beaver - northbound off-ramp – warning signs to slow upon approach to Big Beaver intersection. Clearing of vegetation on inside of curve to improve sight distance.
- Big Beaver - southbound off-ramp – warning signs to slow upon approach to Big Beaver intersection. Clearing of vegetation on inside of curve to improve sight distance.
- Crooks Road - southbound off-ramp – warning signs to slow upon approach to Crooks Road intersection. Clearing of vegetation on inside of curve to improve sight distance.
- Adams Road - northbound off-ramp - warning signs to slow upon approach to Adams Road intersection.
- Square Lake - southbound ramp - warning signs to slow upon approach to Square Lake Road intersection. Clearing of vegetation on inside of curve to improve sight distance.

Intersections

MDOT, the Road Commission for Oakland County, and local communities have completed two of three phases to optimize traffic signals throughout Oakland County. Significant operational and safety benefits at these intersections have, and will continue to be realized. Countermeasures noted for consideration at intersections are:

- 9 Mile Road - overhead signing and better channelization of traffic.

- 11 Mile Road at northbound service drive – larger, updated or additional traffic control devices.
- 14 Mile Road at northbound off-ramp – improvements on 14 Mile Road in the Oakland Mall area would likely benefit the intersection of the ramp ends with 14 Mile Road.
- Rochester Road at northbound off-ramp/northbound on-ramp – improved pavement markings or barriers to prevent left-turn conflicts between movements to/from these ramps.

Potential short-term and long-term crash countermeasures are summarized in Table 2-9.

2.2.7 Goods Movement

Truck traffic data are embedded in all the previous analysis sections related to travel demand, congestion, and safety. Detailed information on existing and future traffic volumes and truck percentages can be found in the *Traffic Analysis Report*.[37] The I-75 traffic analyses were based on the Highway Capacity Manual (HCM) and Highway Capacity Software. In the software, heavy vehicle (truck) adjustments are made within the specific mainline segment, ramp merge, ramp diverge and weaving section areas by entering truck percentages. Assumed heavy truck percentages were eight percent on mainline segments, and five percent on the ramps, based on count data from MDOT. Freeway flow rates were then adjusted using the HCM software, based on the heavy vehicle percentages and the appropriate passenger car equivalents to get to an equivalent flow rate in passenger cars per hour per lane.

While truck percentages are relatively low on I-75 between M-102 and M-59, the effects of congestion on trucking are important. Daily commercial vehicle volumes are between eight and nine thousand north of I-696 and over 13,000 south of I-696. Many of the 8,000-plus trucks leaving the north study limit deliver goods to Flint and points north in Michigan, all the way to Sault Ste. Marie. Some go to Canada. Adding capacity to I-75 in south Oakland County will improve overall travel times for trucks and increase the reliability of deliveries. Reliability and travel time are both key components of just-in-time delivery, which is an ever-increasing component of goods movement.

2.2.8 Conclusion

I-75 is an important component of the transportation system in Michigan and the Midwest. As a result of population increases, land use changes, and increasing local, regional, and national commerce, traffic volumes have been increasing along I-75 in the project area. Coupled with road features that do not meet modern standards, existing traffic volumes are now causing traffic congestion problems. By the year 2025, increased traffic will cause severe congestion through extended periods of the day. Collectively, these problems demonstrate the need to upgrade the existing I-75 mainline and interchanges in the project area to: improve travel efficiency and motorist safety; increase personal mobility; support goods movement for industry; and, maintain the freeway's connectivity with other freeway systems.

[37] *Traffic Analysis Report*, The Corradino Group, November 2003.

Table 2-9
Summary of Crash Countermeasures

LOCATION	SHORT-TERM					LONG-TERM		
Segment	**Warn. Signs**	**Warn. Flashers**	**Glare Screens**	**Cushion Walls on Barriers**	**ITS**	**Main Line Lane Addition**	**Pavement/ Drainage Improve.**	**Comments**
S of 9 Mile to S of I-696 – NB	X	X	X	X		X	X	Shift NB 8 Mile On-ramp to the south.
S of 9 Mile to S of I-696 – SB	X	X	X	X		X	X	Shift SB 8 Mile Off-ramp to the south.
S of I-696 to N of I-696 – NB	X		X			X	X	Braid NB I-696 on ramps with I-75 NB exit to 11 Mile.
S of I-696 to N of I-696 – SB	X		X			X	X	
N of I-696 to S of 12 Mile – NB			X			X	X	Braid NB I-696 on ramps with I-75 NB exit to 11 Mile.
N of I-696 to S of 12 Mile – SB			X			X	X	Shift SB 11 Mile On-ramp to the north.
S of 12 Mile to N of 12 Mile - NB			X			X	X	Braid NB I-696 on ramps with I-75 NB exit to 11 Mile. Improve 12 Mile ramps with interchange reconstruction.
S of 12 Mile to N of 12 Mile – SB			**X**			X	X	Improve 12 Mile ramps with interchange reconstruction.
N of 13 Mile to N of 14 Mile - SB						X	X	Improve 14 Mile ramps with interchange reconstruction.
N of 14 Mile to N of Maple – SB						X	X	
N of Maple to E of Livernois - SB						X	X	Lengthen SB Rochester Road On-ramp.
E of Livernois to Wattles – NB			X		X	X	X	Lengthen Big Beaver On-ramps.
E of Livernois to Wattles – SB			X		X	X	X	Lengthen Big Beaver On-ramps.
S of Adams to Square Lake – SB					X	X	X	Improve Adams Off-ramp.
Ramps								
I-696 to I-75	X				X			Warning signs: “Congestion Ahead”. Braid ramps.
Big Beaver NB Off-ramp	X							Clear vegetation on inside of curve. Advisory speed sign.
Big Beaver SB Off-ramp	X							Clear vegetation on inside of curve. Advisory speed sign.
Crooks SB Off-ramp	X							Clear vegetation on inside of curve.
Adams NB Off-ramp	X							
Square Lake SB Off-ramp	X							Clear vegetation on inside of curve.
Intersections								
9 Mile Road								Overhead signing and better channelization of traffic. Access management.
11 Mile Road @ NB Service Dr.								Improved traffic control devices.
14 Mile Road @ NB Off-ramp								Improvements on 14 Mile Road (by agencies other than MDOT).
Rochester Road @ NB Ramps								Improved markings/barriers to prevent conflicts.

Source: The Corradino Group of Michigan, Inc.
Note: NB means northbound and SB means southbound

SECTION 3
ALTERNATIVES

This section describes how the alternatives were developed and the process that led to the Preferred Alternative.

3.1 Alternatives Development

This EIS examined a variety of alternatives and options that held potential to address the project purpose and need. Environmental and engineering analyses were augmented by computer modeling to examine the effects of developing mass transit and a high-occupancy vehicle (HOV) lane. Technical documentation supports the conclusions reached with respect to these modes.

Alternatives discussion originated with MDOT, FHWA, ideas from the public and the I-75 Council established for the study. The Council consisted of elected officials from the corridor, representatives of planning agencies, and other stakeholders. Interested members of the public also attend these meetings. Meeting dates and key activities at each are listed below. (See Section 6 for more detail).

- May 22, 2002 – Introduction to the project, schedule, information about the first public meeting.
- July 30, 2002 – Review of transit/HOV methodology, indirect and cumulative methodology, the upcoming scoping meeting, and the second public meeting.
- November 7, 2002 – Results of the transit and HOV analyses.
- June 5, 2003 – Review of project status, capacity analysis, crash study results, and preliminary impact analysis results.
- November 20, 2003 – Review of project status and discussion regarding publication of DEIS and public hearing.

Public meetings were held to solicit the views of the public with respect to alternatives development, inform them of the results of the ongoing analysis, and gain their participation in the decision-making process. These meetings and their focus are listed below. The public was encouraged to submit comments on forms provided at each meeting or later, via telephone, fax, or email. Project documents are available on the project web site, which has been continuously updated during the project.

- June 5 and 6, 2002 – Introduction to the project and its schedule.
- August 21, 2002 – Preliminary results of the transit and HOV analyses.
- March 12, 2003 – Preliminary roadway layout, including 12 and 14 Mile Road interchanges. Noise simulation.

No Build, Mass Transit, and several "build" alternatives were analyzed for this EIS, together with Transportation Systems Management (TSM) techniques, Transportation Demand Management (TDM) techniques, and Intelligent Transportation System (ITS) measures. TSM techniques are designed to maximize the efficiency of the arterial street system. TDM involves strategies for managing transportation demand - usually to reduce it or to shift it to different times, locations, routes, or modes. ITS measures involve the collection and dissemination of information to drivers in real time (overhead message boards on freeways), incident management (clearing crashes and breakdowns quickly), traffic signal systems that respond to demand, and similar measures.

A Public Hearing was held January 27, 2004. Based on environmental considerations and public and agency comments received at the hearing and during the comment period, a Preferred Alternative was identified: the HOV Alternative in the peak hours was selected (Section 3.7). The decision making that led to the Preferred Alternative is described in Section 3.9. Below there is a discussion of alternatives considered in the DEIS, including the practical alternatives.

3.2 No Build Alternative

The No Build Alternative consists of continued regular maintenance of I-75. Current bridge and pavement conditions are summarized in Section 2. I-75 was constructed in the 1960s, and it needs major reconstruction. Major reconstruction typically may involve reconstruction of the road base, as well as its surface. Drainage modifications may be required by that reconstruction. This need for major reconstruction of I-75 is independent of the proposed widening project, but would be included in the Preferred Alternative.

Many of I-75's bridges in the project area have undergone rehabilitation/reconstruction since they were constructed. This could involve work on footings, piers, beams, decks, parapet railings, sidewalk/shoulder areas, or other required work. The No Build Alternative would continue a pattern of maintenance and minor adjustments. It would continue use of the combined sewer system in the southern part of the corridor. It would not require the acquisition of additional right-of-way.

The No Build Alternative would result in a breakdown of traffic flow through much of the day.

3.3 Transportation Systems Management (TSM) Techniques

Transportation Systems Management (TSM) techniques apply to the arterial street system, which, in large part, is under the control of local units of government and the Road Commission for Oakland County. The Feasibility Study recommended numerous improvements to arterials. A number of projects are either built or listed in SEMCOG'S *Regional Transportation Plan*. More are needed and await funding. Traffic modeling finds a need for improvements to the arterial system, but because of the way travel demand has developed along I-75, adding capacity to the arterial network cannot alone meet the project purpose and need. Only a lane addition on I-75 can meet that need. TSM techniques are and will continue to be included as area roadway improvements occur.

3.4 Transportation Demand Management (TDM) Techniques

Transportation Demand Management (TDM) means reducing demand or shifting it to different times, locations, routes, or modes. It focuses principally on administrative actions, such as working with major employers to support carpool and vanpool programs, or programs that encourage transit use. MDOT works actively with SEMCOG to promote alternative transportation modes. TDM techniques will continue, but will not alone meet the project purpose and need. These activities will expand, as the HOV Alternative was selected.

Ramp metering is one way to control use of a freeway, by allowing vehicles onto the freeway only when there is capacity. During the Feasibility Study ramp metering was considered, but not included in the recommended plan based upon accumulated experience of similar communities. It is a beneficial TDM technique that has merit on a regionwide basis.

3.5 Intelligent Transportation Systems

Intelligent Transportation System (ITS) measures are continually evolving. They are generally defined as use of technology in transportation to save lives, time, and money. The measures are multimodal, but have particular utility for freeways such as I-75. Techniques include the collection and dissemination of information to drivers in real time (overhead message boards on freeways), incident management (clearing crashes and stopped vehicles quickly), coordinating traffic signals at ramp ends with the surrounding signal system, providing intelligent signal systems that adjust to traffic demand, and other similar measures. With the build alternatives, conduit could be laid at the time of construction in anticipation of future ITS needs.

MDOT and the Road Commission for Oakland County (RCOC) are national leaders in ITS. RCOC's FAST-TRAC program in Oakland County uses SCATS (Sydney Coordinated Adaptive Traffic System). FAST-TRAC is a system that makes better use of existing roadways by employing advanced traffic management technologies to respond, in real time, to actual traffic flow, thus minimizing traffic tie-ups and improving safety. Seven regional computers are connected to a central management system at RCOC's Traffic Operations Center, where traffic engineers monitor conditions and balance traffic flow along major corridors. Along the project length of I-75, FAST-TRAC has been implemented in Hazel Park, Madison Heights, Troy and Auburn Hills. The system in undergoing continued expansion. Improvements in the interface with MDOT's ITS program are likewise ongoing.[38] The FAST-TRAC program will continue independently of the proposed I-75 project and will support it.

MDOT's ITS program in Southeast Michigan includes 180 miles of freeways, with closed circuit television cameras, changeable message signs, and traffic detecting loops. There are plans for additional surveillance and detection equipment on I-75, and additional changeable message signs near M-59.[39] The Michigan Intelligent Transportation System (MITS) Center in downtown Detroit operates the system and houses the Michigan State Police's 911 Regional Dispatch Center. Further, there has been research performed on a "511" system and DIRECT (Driver Information Radio). These systems would provide current traveler information. MDOT's 511 Feasibility Study has just been initiated.

Research indicates that more than fifty percent of total delay experienced by urban motorists results from incidents (accidents, stopped vehicles, debris in the road, and other conditions or distractions).[40] Recognizing this reality, MDOT, in conjunction with a number of Southeast Michigan governmental units and private sector participants, sponsors the Freeway Courtesy Patrol program. This program keeps service vans ready to clear incidents along several area freeways. Patrols currently operate over the entire length of I-75 from downtown Detroit to the north Oakland County line. SEMCOG has performed an analysis of 2002 data that found significant air quality and travel time benefits from the program.[41]

ITS maximizes use of the existing transportation infrastructure, but cannot substitute for physical expansion of roadway capacity, once efficiency is maximized. For this reason, while ITS will be an ongoing component of traffic management on I-75, it will not alone meet the project purpose and need.

[38] *Draft ITS Predeployment Study*, Cambridge Systematics, 2002.
[39] Ibid.
[40] *The 2002 Urban Mobility Report*, Schrank and Lomax, Texas Transportation Institute, June 2002.
[41] *MDOT Courtesy Freeway Patrol in Southeast Michigan: 2002 Evaluation Report*, SEMCOG, July 2003.

3.6 Mass Transit

The EIS included an extensive study of whether a rapid transit system can meet the purpose and need for the project (Figure 3-1). Rapid transit has significant potential in the Woodward Corridor (which parallels I-75) south of 9 Mile Road, but analysis shows rapid transit and an extensive supporting bus system do not eliminate the need for the proposed lane addition on I-75 through the study area of M-102 (8 Mile Road) to M-59.[42]

A high performance, generic transit concept was evaluated on Woodward Avenue from downtown Detroit (Jefferson Avenue) to Pontiac. The Woodward Corridor has been the historic focus of mass transit analysis, and there has been general agreement that when rapid transit develops, it will be done first in the Woodward Corridor.[43] The mass transit system was given every opportunity in the modeling effort for this project to attract riders, e.g., frequent feeder bus service in Oakland County (which does not exist today), rapid transit vehicles on exclusive right-of-way along Woodward Avenue at speeds as high as physically feasible, and optimal spacing of stations/stops between downtown Detroit and Pontiac along Woodward Avenue. More specifically, the system was characterized by:

- High speed (60 mph where distances and conditions permit);
- High quality vehicles with a quiet, smooth ride;
- Separation from other traffic to avoid congestion;
- Short headways – 3 minutes;
- Short dwell times at stations – 15 seconds or less;
- Timed transfers with intersecting routes to avoid missed transfers;
- Communication between buses also to avoid missed transfers;
- Park-and-ride lots at stops north of, and including, the Michigan State Fairgrounds;
- Fare integration with intersecting transit to permit a single fare for all trip segments; and,
- Pre-paid fares at platforms to reduce boarding times.

The result is a rapid transit system that attracts almost 50,000 daily riders. But, ridership was found to fall off sharply north of M-102 (8 Mile Road) (Table 3-1). As a result, even the rapid transit system that was modeled does not eliminate the need to add a lane to I-75 in Oakland County. Several reasons are apparent:

- Oakland County residential development is too dispersed to support a high level of transit service.
- Many I-75 trips are internal to Oakland County and not easily diverted to transit.
- There is more travel demand in the I-75 corridor than there is capacity. This means that when rapid transit diverts motorists from I-75, others who would typically use the road, except for its heavy congestion, quickly replace them.

[42] *I-75 Corridor Planning/Environmental Study Refined Analysis of Transit and HOV Concepts (Technical Memorandum No. 2)* by The Corradino Group for the Michigan Department of Transportation, October 2002.

[43] Between December 1975 and April 1977 the Southeast Michigan Transportation Authority conducted detailed studies of Southeast Michigan's travel corridors and concluded that the first-stage light rail element that resulted from planning would be in the Woodward Corridor.

Figure 3-1
Mass Transit Alternative

SOURCE: The Corradino Group of Michigan, Inc.

Table 3-1
Rapid Transit Station Activity

STATION LOCATION	STATION ACCESS TYPES[a]	DAILY ONS + OFFS	DAILY 2-WAY LOADINGS
Pontiac Transportation Center	Auto, Walk, Bus	2,204	2,204
Square Lake Road	Auto, Walk, Bus	3,047	2,567
Long Lake Road	Auto, Walk, Bus	244	2,645
Big Beaver Road	Auto, Walk, Bus	674	2,747
Maple Road	Auto, Walk, Bus	1,533	3,586
14 Mile Road	Auto, Walk, Bus	2,339	4,675
13 Mile Road	Auto, Walk, Bus	3,968	6,517
12 Mile Road	Auto, Walk, Bus	3,511	7,254
11 Mile Road	Auto, Walk, Bus	1,252	7,428
10 Mile Road	Auto, Walk, Bus	1,312	7,902
9 Mile Road	Auto, Walk, Bus	5,217	8,933
M-102 (8 Mile Road)	Auto, Walk, Bus	4,395	12,016
7 Mile Road	Walk, Bus	3,892	13,594
McNichols Road	Walk, Bus	4,851	15,119
Woodland Avenue	Walk, Bus	1,693	15,914
Trowbridge Road	Walk, Bus	2,889	17,749
Hazelwood	Walk, Bus	4,243	19,508
Mount Vernon	Walk, Bus	4,661	21,169
Grand Boulevard	Walk, Bus	3,039	20,868
Antoinette	Walk, Bus	4,901	20,901
Warren	Walk, Bus	6,306	22,295
Alexandrine	Walk, Bus	3,841	22,258
Mack Avenue	Walk, Bus	511	22,237
Alfred	Walk, Bus	5,018	22,145
I-75	Walk, Bus	1,639	21,206
Grand Circus Park	DPM, Walk, Bus	4,884	16,376
Campus Martius	Walk, Bus	12,321	5,179
Jefferson Avenue	Walk, Bus	5,179	0

Source: The Corradino Group of Michigan, Inc.
[a] Stations north of 7 Mile Road have parking. All stations have walk and bus access. Walk access is much better in the south, where people live closer to stations. The DPM is the Detroit People Mover.

The section of I-75 between 8 Mile Road and I-696 would experience the greatest potential diversion of trips with a rapid transit system in the Woodward Corridor, about 100 vehicles in the peak hour. By comparison a single freeway lane can carry upwards of 2000 vehicles per hour. Thus, modeling indicates only a small diversion of trips from I-75. But, traffic demand is so strong these "diverted" auto users are replaced by others. The current status of rapid transit planning in the corridor is discussed in Section 4.2.3.

In summary, a rapid transit system along the Woodward Corridor clearly shows viability, at least as far north as 9 Mile Road, but it cannot meet the project purpose and need. A rapid transit system would offer an alternative means of travel and has merit, independent of the I-75 project, and MDOT supports such transit development.

3.7 Build Alternatives

The "build alternatives" included adding a through travel lane between M-102 (8 Mile Road) and M-59 to bring the total to four lanes in each direction.[44] The lane could be implemented for general use by all vehicles all the time, or could be restricted to use by HOVs during peak travel periods. The lane addition supplement the planned major reconstruction of I-75. Both alternatives also included reconstruction of the 12 Mile and 14 Mile interchanges and braiding the ramps from I-696 to northbound I-75 with a shifted off-ramp to 11 Mile Road. Six pedestrian bridges would be reconstructed over I-75. A sidewalk would be added along the service drive north-south through the I-696 interchange. Bridges in the depressed section would be replaced, as the lane addition would require all these bridges to be longer. The bridges at the 12 and 14 Mile Road interchanges will be reconstructed along with the entire interchange. At 13 Mile Road, and all locations north of 14 Mile Road, bridges will be widened to the inside.

The development of a general-purpose lane or HOV lane is described below. Then there is discussion of 10-foot inside (median) shoulders, the curve on I-75 at Big Beaver Road, special considerations at Square Lake Road, and ties to the separate I-75/M-59 project. Finally, there is discussion of proposed changes at the I-696, 12 Mile Road, and 14 Mile Road interchanges.

3.7.1 I-75 Lane Addition for General Purpose Use – GP Alternative

Between M-102 (8 Mile Road) and a point south of 12 Mile Road, I-75 is in a "cut" section. Crossroads are at grade and I-75 passes under these roads. "Slip ramps" serve traffic entering and exiting the freeway from adjacent service drives (parallel, one-way, local roads adjacent to the freeway). Addition of a fourth through lane in this section would occur by cutting into the existing side slopes (Figure 3-2). In some cases, the adjacent service drives will be narrowed to prevent the need for acquisition of right-of-way from bordering properties. At each low point in I-75, under the crossroads, a pump station now exists in the embankment area. These pump stations move storm water up and away from the low points into receiving pipes that now flow to a combined sewer system (handling sewage and storm water in the same system). The pump stations will have to be relocated or modified. The Preferred Alternative will direct I-75 storm water away from the combined sewer system to improve water quality (see Section 4.10.2).

Six pedestrian bridges now provide access across I-75 in the depressed section south of 12 Mile Road. These would be reconstructed, because their supporting piers would be affected by the lane addition. The bridges are at: Bernhard Avenue, Harry Avenue, Highland Avenue, Orchard Avenue, Browning Avenue, and Bellaire Street. The underclearance of the bridges must be increased two to three feet[45] and reconstruction must conform to the Americans with Disabilities Act (ADA), which requires more gradually sloping ramps. Example layouts are provided in Figure 3-3. These would be subject to refinement during the design phase of the project. Note that the Harry Avenue pedestrian bridge could require relocation of three homes. An option that may become available is the construction of elevators rather than ramps. Elevators in conjunction with stairs (rather than ramps) offer the possibility of eliminating the need for right-of-way acquisition in reconstructing the pedestrian bridges (see Section 4.2.2).

[44] During the 2000 Feasibility Study the concept of a reversible lane was considered. However, north-south travel demand is so balanced that a reversible lane was not reasonable.

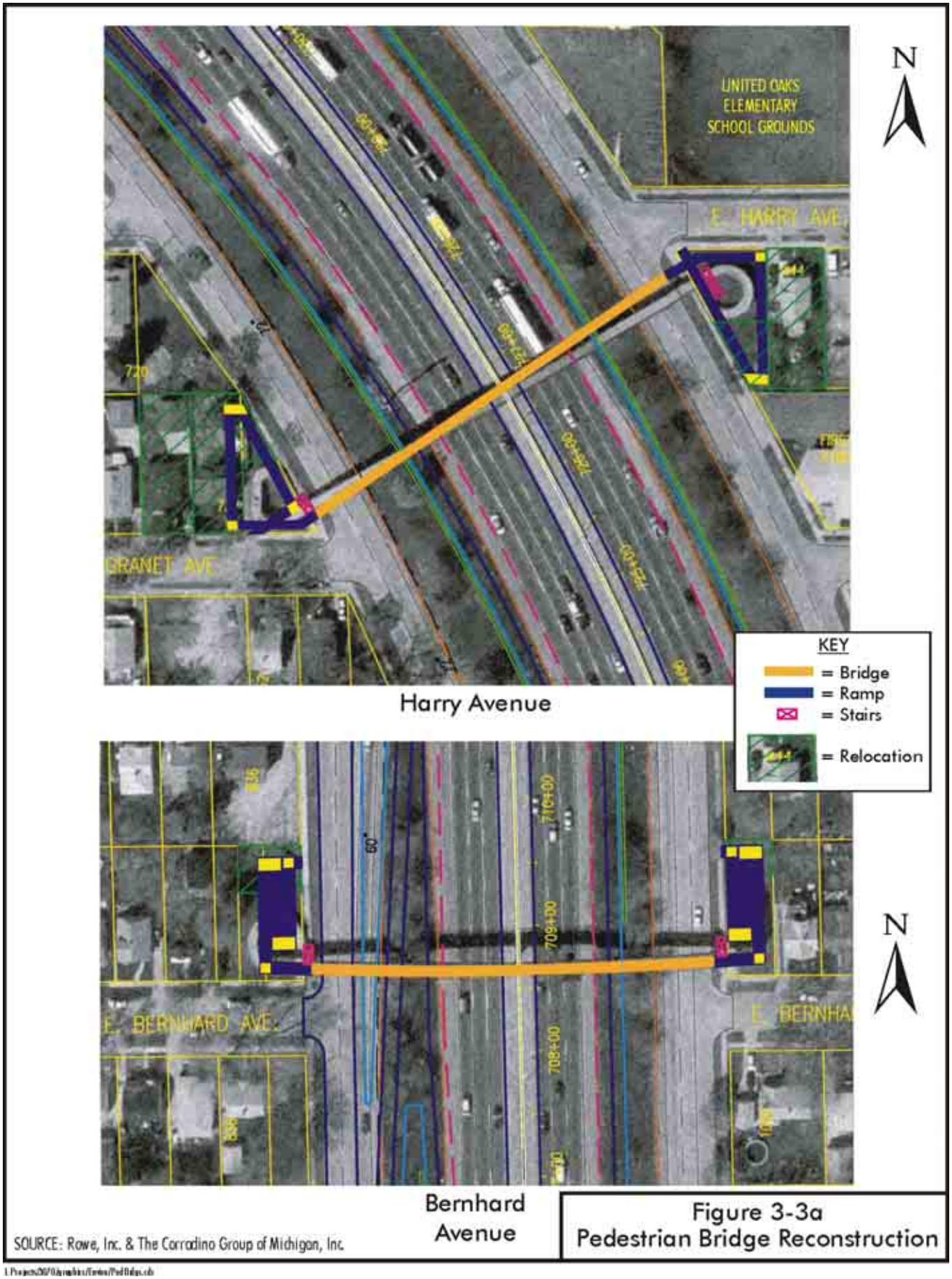
[45] Pedestrian bridges have an extra-high under-clearance of 17'3" over the service drives to prevent bridges from being hit by vehicles passing underneath.

I-75 in Depressed Section

I-75 in At-Grade Freeway Section

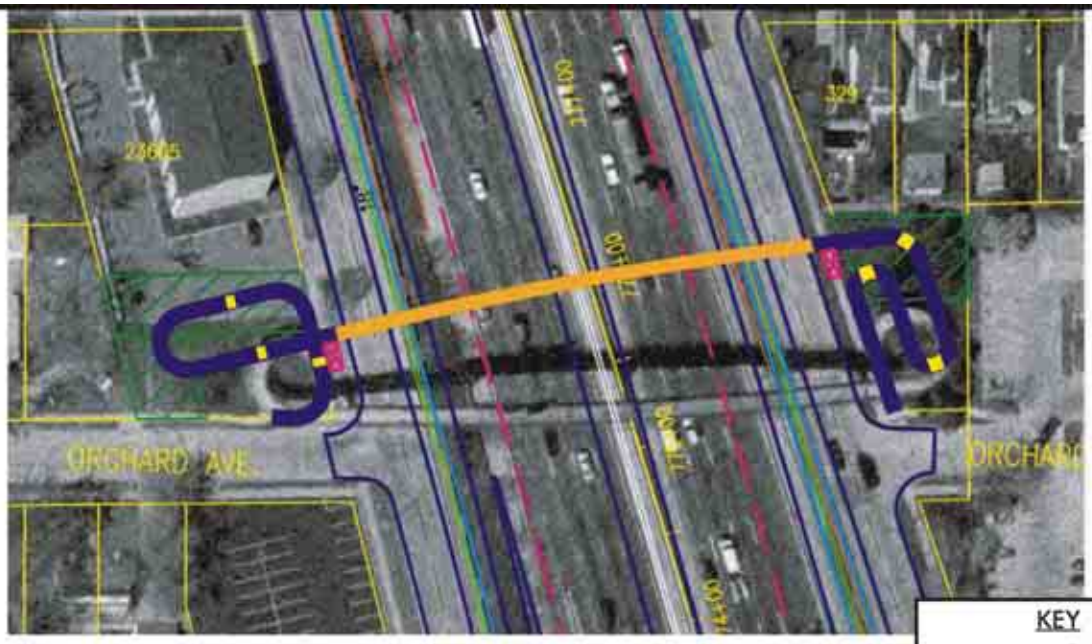
Figure 3-2
Lane Additions on I-75

SOURCE: The Corradino Group of Michigan, Inc.



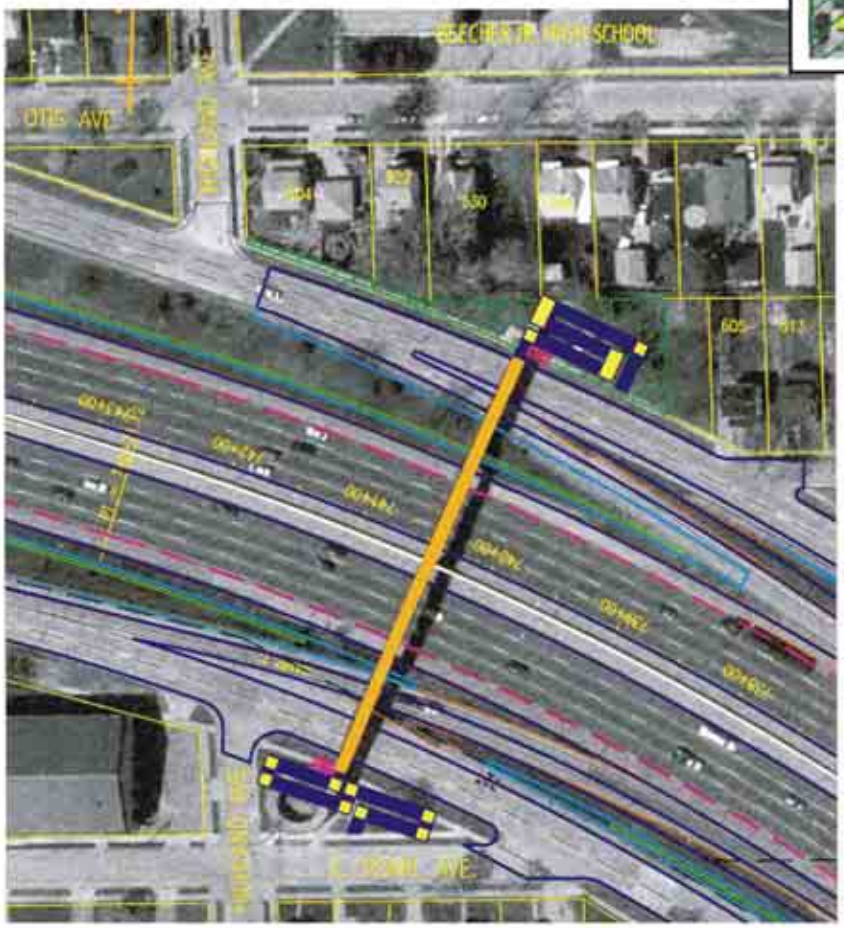
SOURCE: Rowe, Inc. & The Corradino Group of Michigan, Inc.

Figure 3-3a
Pedestrian Bridge Reconstruction



Orchard Avenue

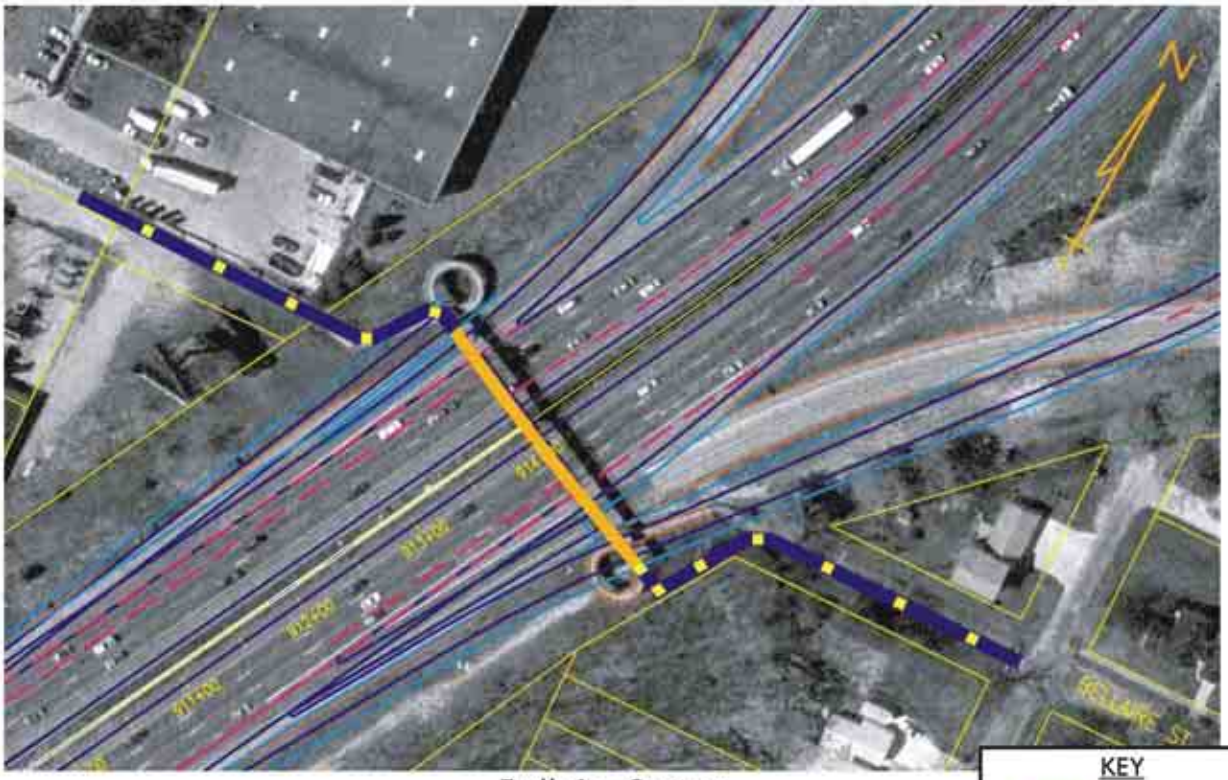
KEY
= Bridge
= Ramp
= Stairs
= Relocation



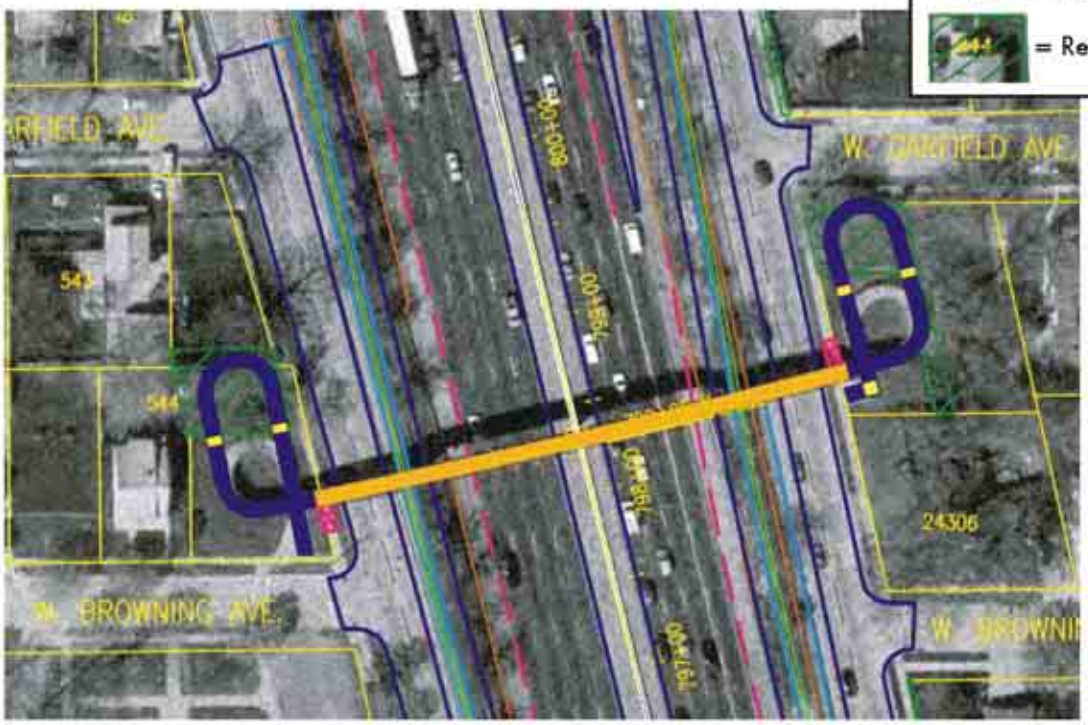
Highland Avenue

SOURCE: Rowe, Inc. & The Corradino Group of Michigan, Inc.

Figure 3-3b
Pedestrian Bridge Reconstruction



Bellaire Street



Browning Avenue

SOURCE: Rowe, Inc. & The Corradino Group of Michigan, Inc.

Figure 3-3c
Pedestrian Bridge Reconstruction

I-75 is either at grade or elevated in the northern part of the project length. I-75 passes under Gardenia Avenue, then over 12 Mile Road, the next crossroad to the north. The lane addition in this section would be constructed in the existing median north as far as Square Lake Road (Figure 3-2). Because there is a left exit from northbound I-75 to westbound Square Lake Road, and a left entrance from eastbound Square Lake Road to northbound I-75, the northbound lane addition would have to be modified, as the median ends. The left exit and entrance interfere with the continuation of the additional lane on the median side. Therefore, a general-purpose lane addition northbound would have to transition from inside to outside through the interchange.

North of Square Lake Road to beyond M-59 there are already four through lanes. Two auxiliary lanes are planned with the I-75/M-59 project. These will form the exit lanes to M-59. The north limit of the I-75 lane addition project is north of South Boulevard where the two lanes (eastbound-to-northbound) from Square Lake Road join the four northbound lanes of I-75 to form the planned six lanes proceeding north.

On southbound I-75 five lanes now pass under South Boulevard. Two lanes exit to westbound Square Lake Road and three continue as southbound I-75. With the project, the three inside (median) lanes would maintain their current position under the South Boulevard bridge. The fourth lane (counting from the inside to the outside) would become a "decision lane." Drivers in that lane will be able to exit to westbound Square Lake Road or continue south on I-75 (see Section 3.7.3). As this fourth lane proceeds south, it would be a "new" lane, positioned on the outside of the three existing lanes. But, south of Square Lake Road, the new lane is to be on the inside (median side). This means I-75 will be reconstructed in this section to align the four southbound lanes properly.

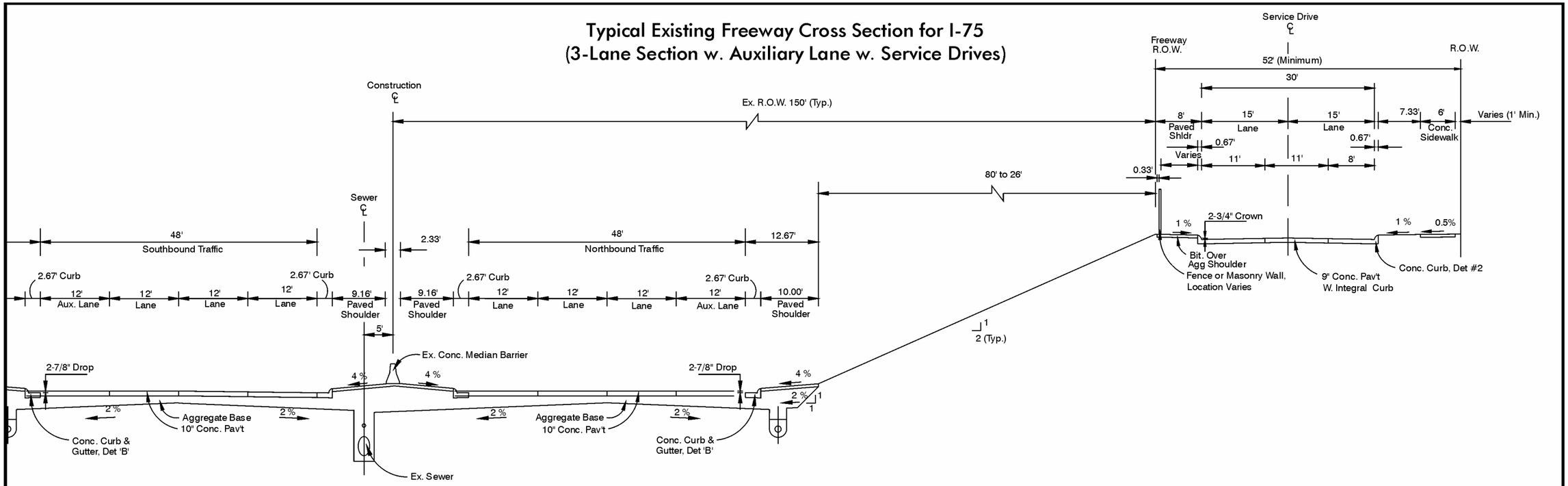
The lane additions just described will almost entirely occur within existing MDOT right-of-way. Figure 3-4 shows typical sections.

With the exception of the 9 Mile Road "S" curve discussed in the following paragraphs, the Preferred Alternative will bring I-75 up to full, modern, design standards. This will be accomplished by changing the roadway profile, increasing superelevations in curves, making compatible changes to curve radii and lengths (these need be very minor only), and changing ramp profiles and lengths. A 70 mph design speed is planned.

I-75 Lane Addition to Full Standards

The GP alternative would bring I-75 to full, modern standards, with the exception of the 9 Mile Road "S" curve. The south curve is designed for 70 miles per hour and meets standards. However, there is no tangent (straight) section between that curve and the return curve to the immediate north. And, the north curve is too sharp. An analysis was performed of adding the appropriate tangent section between the curves and redesigning the north section of the "S" curve. There is advisory signing to drive at 50 miles per hour through the curve today and the crash rate for northbound traffic in this curve is higher than for other sections of I-75 (see Table 2-8). Adding the appropriate transition length between the two curves and bringing the north curve up to standards would push I-75 into the adjacent neighborhood to the west. More than 150 parcels would likely be affected, including approximately 100 residential units, 20 business structures, a church, an elementary school, and vacant lots (Figure 3-5). The additional cost would exceed $100 million. The safety benefit is marginal. In this confined driving environment benefits would come from a reduction in the non-fatal accident rate and the benefit/cost ratio would be only 0.44:1. Due to the significant social impacts and cost, this option is not considered practical. Crash countermeasures are recommended in Section 2.2.6.

Typical Existing Freeway Cross Section for I-75
(3-Lane Section w. Auxiliary Lane w. Service Drives)



Typical Proposed Freeway Cross Section for I-75
(4-Lane Section w. Auxiliary Lane w. Service Drives)

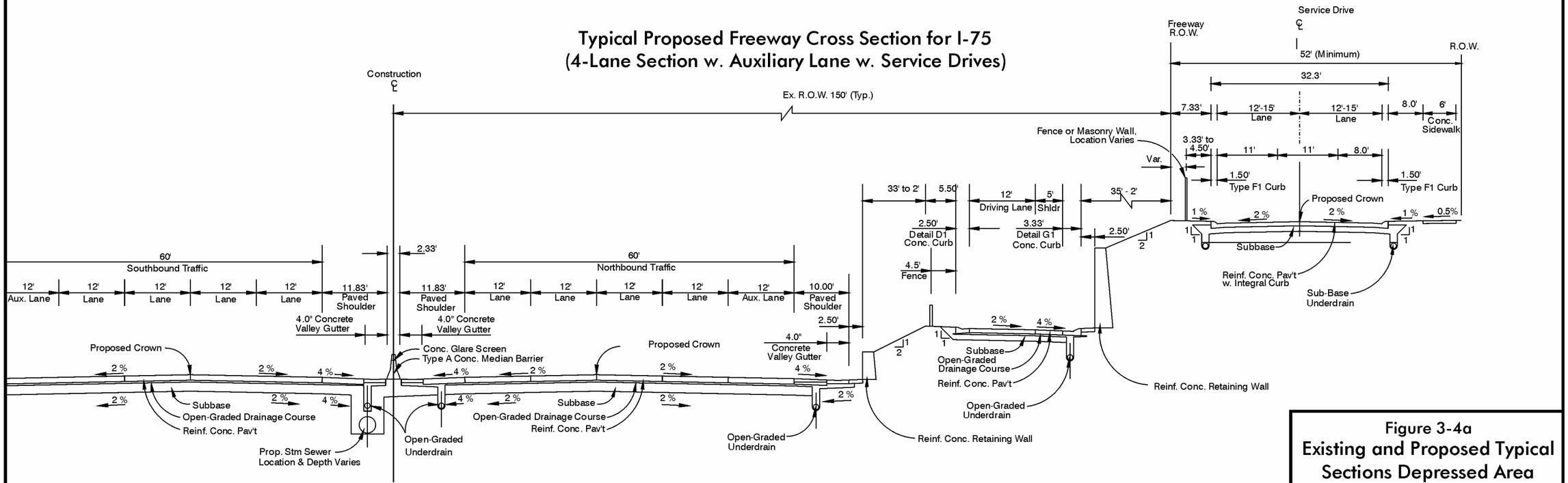
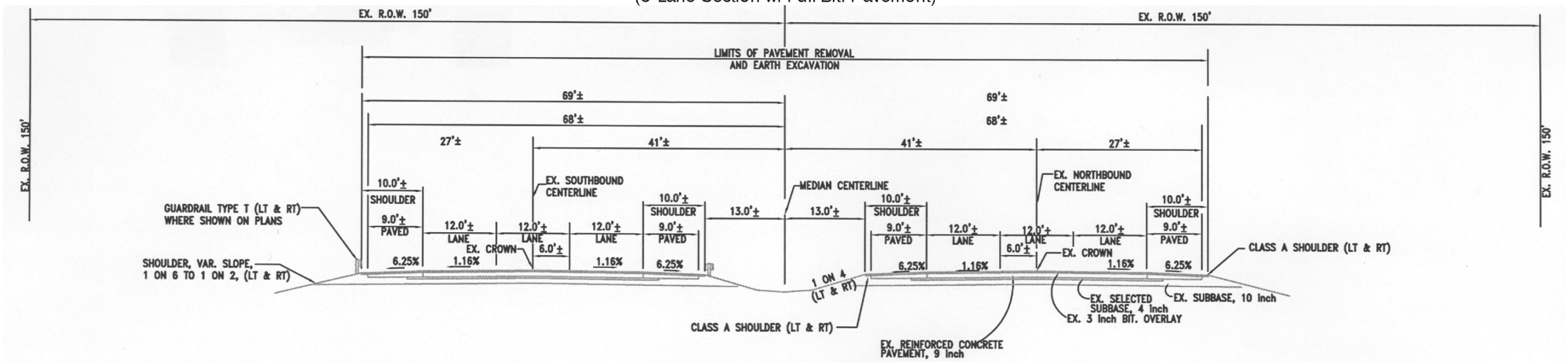


Figure 3-4a
Existing and Proposed Typical Sections Depressed Area

Typical Existing Rural Freeway Cross-Section for I-75
From Twelve Mile Rd. to South of M-59
(3-Lane Section w. Full Bit. Pavement)



Typical Proposed Rural Freeway Cross-Section for I-75
From Twelve Mile Rd. to South of M-59
(4-Lane Section w. Pavement)

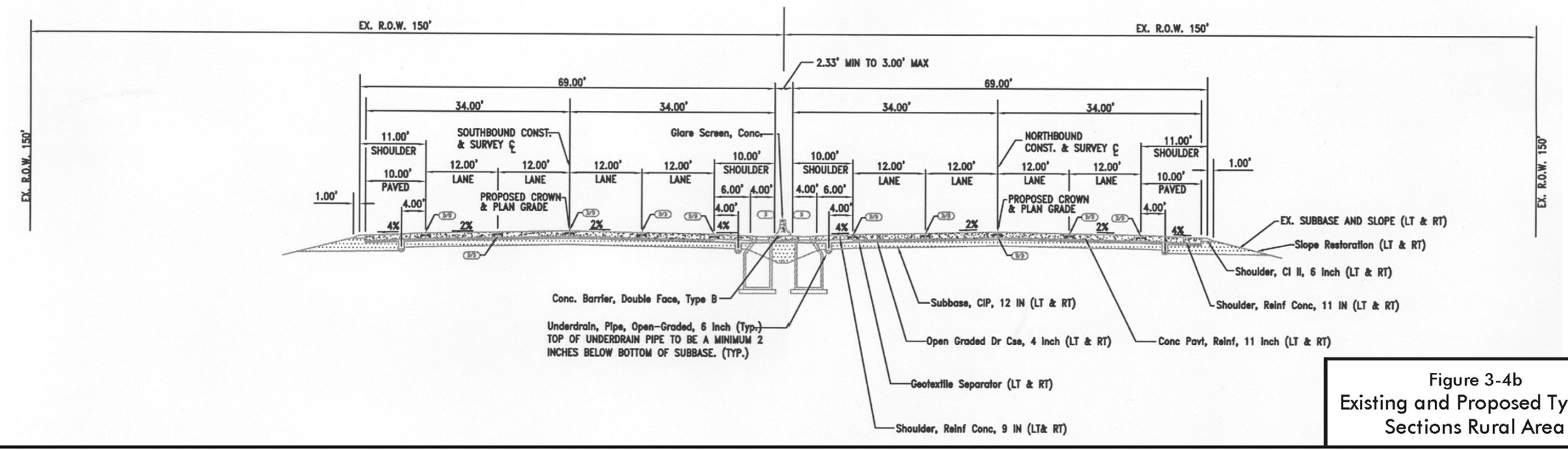


Figure 3-4b
Existing and Proposed Typical Sections Rural Area